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NORTH IDAHO TIMBER MANAGEMENT DRAFT EIS

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Enclosed for your review and comment is the Draft Environmental Impact Statement (EIS) on proposed timber management for the Bureau of Land Management (BLM), Coeur d'Alene District of northern Idaho. This document has been prepared by a team of resource specialists and is based on information from the BLM and other sources, including information supplied by consultation with Federal, state, and local agencies, and interested private organizations and individuals.

The purpose of the statement is to disclose in advance the probable environmental impacts of the alternatives including the proposed action, and to assure that these factors are considered, along with technical and other considerations, in the decision-making process.

We would appreciate receiving your written comments on this environmental impact statement. The comment period will run until September 15, 1980. Following the public review period a final document will be prepared using the comments received through the review process. This final document should be published in December 1980.

Should only minor changes be required in the final document, it will be published in an abbreviated format containing documentation of public comments and responses and an addendum section of changes made to the draft. It is recommended, therefore, that you retain your copy of the draft EIS for reference purposes.

Written comments should be submitted by September 15, 1980 to:

Ted Graf
North Idaho Timber EIS Team Leader
Bureau of Land Management
P. O. Box 1889
Coeur d'Alene, Idaho 83814

Sincerely yours,

Martin J Zimmer

District Manager

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NORTH IDAHO TIMBER MANAGEMENT ENVIRONMENTAL IMPACT STATEMENT
DRAFT

Prepared By
BUREAU OF LAND MANAGEMENT
COEUR D'ALENE DISTRICT OFFICE

C Buffington

STATE DIRECTOR, IDAHO STATE OFFICE

NORTH IDAHO TIMBER MANAGEMENT
ENVIRONMENTAL IMPACT STATEMENT

(X) Draft ( ) Final Environmental Impact Statement

1. Type of Action: (X) Administrative ( ) Legislative

2. Responsible Agencies:

   a. Lead Agency: Department of the interior, Bureau of Land Management

   b. Cooperating Agencies: None

3. Abstract: The North Idaho Timber Management Environmental Impact Statement analyzes the effects of a 10-year timber management program on public lands in northern Idaho. Six timber management alternatives including the proposed action are presented for consideration and are analyzed in terms of their projected environmental (including economic) effects. Each alternative considers a different level of timber management acreage and practices.

This document will be used to determine the proper intensity of timber management on the public lands using the multiple use sustained-yield concept. Its contents exemplify the conflicting demands being placed on public lands and the fact that concessions are necessary to achieve an equitable balance between commodity resource use and resource protection. The timber management program selected for the subject public lands will be based upon the analysis presented in this document.

4. Comments Must Be Received By: September 15, 1980

5. Send Comments To - Or For Further information Contact:

Martin J. Zimmer, District Manager or
Ted Graf, EIS Team Leader
Bureau of Land Management
P. O. Box 1889
Coeur d'Alene, Idaho 83814
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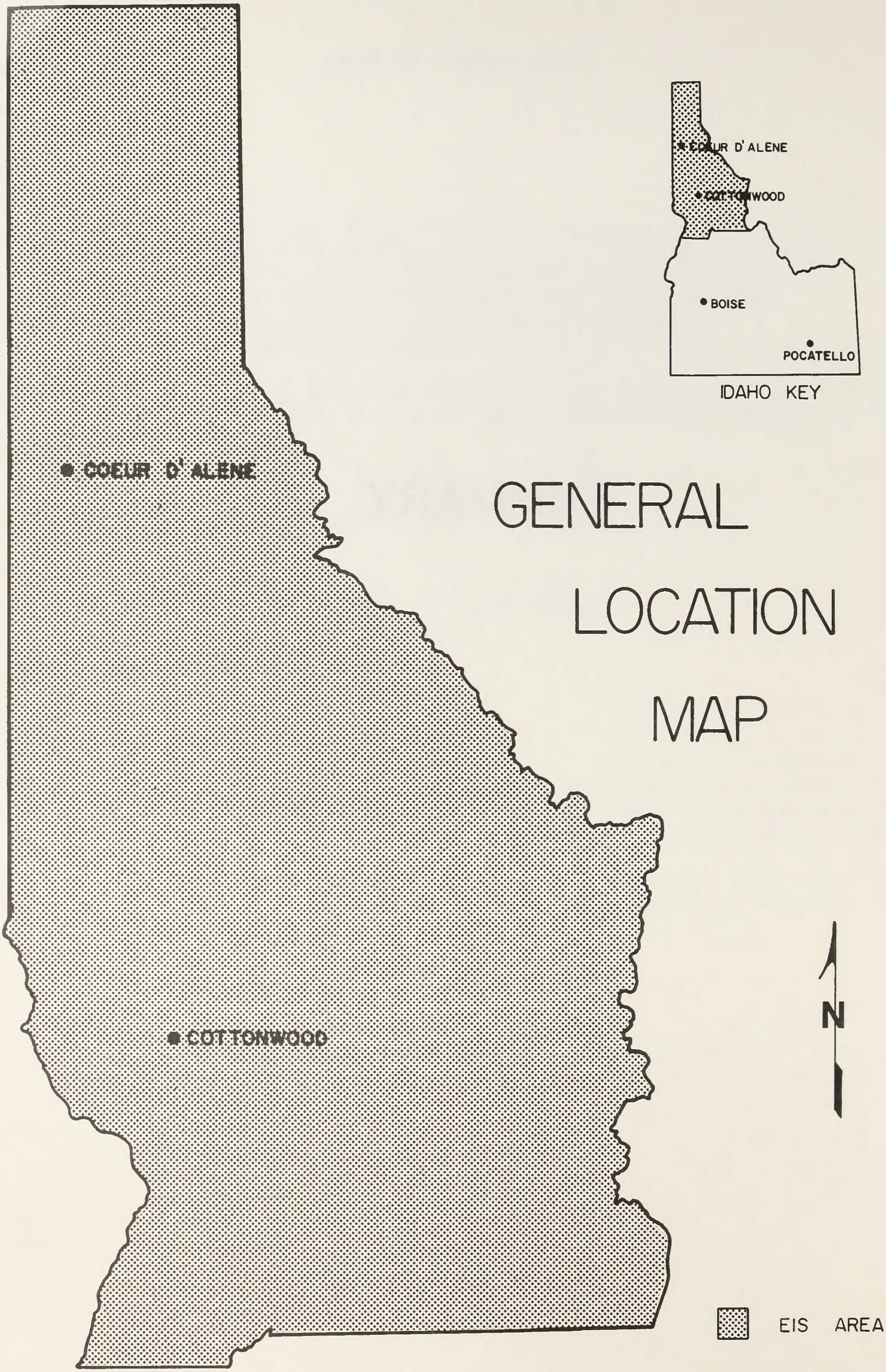

SUMMARY

INTRODUCTION

The purpose of this environmental impact statement (EIS) is to provide the decision maker and the public with an assessment of environmental impacts which would or could result from implementation of a 10-year timber management program on public lands in northern Idaho. Most aspects of the proposed timber management alternatives were developed through the Management Framework Plan (MFP) component of the Bureau of Land Management (BLM), Coeur d'Alene District's land use and allocation plan.

During the "scoping" phase of the EIS process, several issues were identified by other agencies and the public. These included the proposed level of timber harvest; possible local and regional economic impacts from the timber management plan; and the plan's possible effects on water quality and wildlife habitat. These issues have been addressed in this document.

The EIS area is located in the panhandle of northern Idaho. Of the almost 14,000,000 acres within the area, only 271,425 acres (1.9%) are managed by BLM. During the past decade, the volume of timber harvested from BLM lands within the EIS area has averaged about one percent of the total volume harvested.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

The BLM has proposed the following six alternatives:

PROPOSED ACTION ALTERNATIVE

The proposed action alternative proposes an annual harvest of approximately 2.6 million cubic feet of timber (14.05 million board feet) to be harvested from 80,489 acres of land available for timber production. Clearcutting, two-stage shelterwood cutting, and single-tree selection cutting practices would be employed. Timber management practices would include methods for slash disposal, site preparation, reforestation, precommercial thinning, commercial thinning, and fertilization. The proposal also includes the construction of roads to provide a means of moving logs from the cutting area loading site. The annual harvest proposed under this alternative is approximately 2.77 million board feet more than the annual average for the past 10 years.

ALTERNATIVE A (NON-COMMODITY EMPHASIS)

Alternative A emphasizes non-commodity values and protection and enhancement of the natural environment. Under this alternative, an annual harvest of approximately .6 million cubic feet of timber (3.23 million board feet) would be realized from 19,685 acres of land available for timber production.

ALTERNATIVE B (COMMODITY EMPHASIS)

Alternative B emphasizes the production of commodity resources including timber. Approximately 3.02 million cubic feet (16.61 million board feet) of timber would be harvested annually from 89,333 acres allocated to timber production.

ALTERNATIVE C (NO-ACTION)

Alternative C would continue the current level of timber management. Under this alternative, approximately 2.05 million cubic feet (11.3 million board feet) of timber would be harvested from 86,103 acres available for timber production. No fertilization, very little reforestation planting, and only limited thinning would take place.

ALTERNATIVE D (OVERMATURE ACCELERATED HARVEST)

Alternative D would be the same as the proposed action alternative but would increase production in the short term by 10 percent (1.41 million board feet annually) for 40 years through the harvest of overmature timber. Under this alternative, the total annual harvest would be 15.46 million board feet for 40 years which would then return to 14.05 million board feet.

ALTERNATIVE E (TRANSFER OF STATE LIEU LANDS)

Alternative E would reduce the amount of land available for timber management through transfer to the State of Idaho under the Lieu Selection process. Under this alternative, an annual harvest of 11.07 million board feet would be realized from 70,087 acres available for timber production.

ENVIRONMENTAL CONSEQUENCES

AIR QUALITY

The primary impacts to air quality would be particulate emissions resulting from prescribed burning and road use. These emissions would range from 1,600 tons per year under alternative A to 3,000 tons per year under alternative B. When compared to the region as a whole, these emissions would range from .08 percent to .43 percent of the total for the region. Impacts to air quality are deemed to be insignificant under any alternative.

SOILS

Primary impacts to the soils resource would be soil loss and soil compaction, which reduce soil productivity. Road construction and maintenance would be the major causes of erosion, and yarding would be the major cause of compaction. Soil losses would range from approximately 320 tons per year average under alternative A to about 1,600 tons per year average under alternative B. Acres compacted due to yarding would range from 236 acres for the decade under alternative A to 1,210 acres for alternative B. These soil loss and compaction rates would not be regionally significant for any alternative.

WATER RESOURCES

The main impacts of the timber management program on water resources would be increased water yield due to vegetation manipulation (road construction, timber harvest, yarding, slash disposal) and increased sediment yield due to land disturbances (road construction, yarding, slash disposal, mechanical scarification).

Water yield increases would range from a low of 93 acre feet per year with an equivalent flow of .13 cubic feet per second for alternative A to a high of 477 acre feet per year with an equivalent flow of .66 cubic feet per second under alternative B. When compared to the estimated water yield from all district lands (305,000 acre feet per year, 422 cubic feet per second), the increases resulting from any alternative would be insignificant.

Sediment yield increases as measured in tons of sediment reaching streams ranges from 1,300 tons (for a 10-year period) for alternative A to 6,500 tons under alternative B. When compared to overall existing sediment levels, the levels resulting from any alternative would be insignificant.

VEGETATION

Impacts to vegetation would include the initial destruction of vegetation caused by road construction, harvest, yarding, and other practices; loss of vegetation production on areas of newly constructed running road surface; and alterations in habitat which would increase the growth potential of commercial trees.

Road construction would eliminate biological productivity (including timber) on from 32 acres for alternative A to 270 acres for alternative C. This impact would not be significant.

Management activities such as site preparation, planting of seedlings, fertilization, and thinning would increase timber productivity by about 20 percent. Known populations of threatened or endangered plant species would not be affected by any alternative.

ANIMALS

None of the alternatives would significantly impact terrestrial animals. For the decade, elk would lose 91 acres of habitat under alternative A increasing to a high of 662 acres under alternative B. Habitat losses for snag-dependent species would range from 444 acres to 2,274 acres. Of the endangered, threatened, or sensitive species occuring in north Idaho, it is anticipated that none would be affected by any alternative.

To some degree, the alternatives would have the following effects on aquatic habitat: 1) altered stream flow regimes; 2) water temperature changes; 3) logging debris accumulations; 4) increased accumulations of bottom and suspended sediments; and 5) the introduction of fertilizers into water courses. None of these effects would be of a significant nature.

Stream crossings of Class I streams would have an effect on fish habitat. Habitat losses would range from 40 feet under alternative A to 200 feet under alternatives B and D. When compared to available habitat, these losses would be insignificant.

CULTURAL RESOURCES

No adverse impacts to listed or eligible National Register properties would result from any alternative. The potential exists, however, that unknown cultural resource sites could be adversely affected by timber management activities. Any damage to a site could be of a permanent nature.

VISUAL (SCENIC) RESOURCES

Implementation of any of the alternatives would cause localized disruptions of the landscape. These would affect scenic quality to some degree; however, due to the scattered land ownership pattern and limited acreage involved, the overall impact would be minor.

LAND USES

Opening the forest canopy would provide increased forage for domestic livestock. In some cases, lessees may have to locate alternative grazing pasture during periods of forest restocking.

Timber management activities would affect recreational setting and activity opportunities. These changes would be insignificant overall due to the small amount of land affected.

SOCIAL VALUES

Despite the large Federal ownership of land in the EIS area (61%), the BLM manages only 1.9 percent of the total land area. These BLM-administered lands are widely scattered throughout the area. Because of this intermingling of lands and due to the absence of large blocks of land under BLM management, it is unlikely that any particular social system or lifestyle is primarily dependent on BLM land for survival. The effects on the social systems of the area would be minimal from any alternative.

ECONOMICS

Employment and income would be affected by the timber management program. On a regional basis, employment changes would vary from a loss of 122 jobs under alternative A to a gain of 80 jobs for alternative B.

Total regional income for the decade would vary from a loss of almost 1.7 million dollars under alternative A to a gain of 1.1 million dollars for alternative B.

ENERGY CONSUMPTION

Implementation of any alternative would be considered an intensive energy investment. It is assumed that all energy consumed would be in the form of fossil fuels. Energy usage would range from 310 million Btus to 1,600 million Btus depending on the alternative chosen.

CHAPTER 1

PURPOSE AND NEED

CHAPTER I
PURPOSE AND NEED

This Environmental Impact Statement (EIS) is being prepared to assist the decision maker and the public in assessing the environmental impacts, including social and economic, of a 10-year timber management program on public lands administered by the Bureau of Land Management (BLM), Coeur d'Alene District, Idaho. The EIS area is in the panhandle of northern Idaho and includes all or portions of the 11 northern counties. Of the total 14 million acres in this area, approximately 271,425 acres (1.94%) are administered by BLM.

The underlying purpose of the alternatives proposed is to manage the public forest lands under the principles of multiple use and sustained yield in accordance with developed land use plans. These land use plans, known as Management Framework Plans (MFP), allocate land for timber management and other uses and prescribe various methods, intensities, and constraints for timber management (the MFPs are on file in the Coeur d'Alene District Office.) Of the approximately 157,455 acres in the EIS area that meet the definition of productive forest lands, the MFP has proposed about 80,000 acres for timber management. The interrelationships of land allocation between timber management and other resource values have been identified in the MFP; however, there exists a need to analyze and document the environmental consequences of timber management activities on those lands tentatively allocated for timber management. This document will fulfill that need.

The goal of the alternatives is to provide timber to help meet projected national demands for wood products while protecting the basic natural components of the environment.

SCOPING

The scope of the environmental impact statement and a determination of sensitive and significant issues was made through informal public contact and eight MFP public meetings held in January 1980. A description of the alternatives was sent to governmental organizations, interest groups, industry representatives, and other concerned individuals in February 1980. The public was asked to identify and prioritize the issues they felt required consideration in this EIS.

Based on public input, several issues were identified. The proposed level of harvest and the possible local and regional economic impacts from the timber management plan was the major issue identified. Other issues included the possible effects of the proposal on water quality and wildlife habitat. The EIS will address these areas of concern.

BACKGROUND

The BLM has administered timber harvests from public lands in northern Idaho since 1948. Annual harvest levels have been determined strictly by budgetary allocation of funds. Historically, these allocations have been earmarked for timber harvest activities only. Management practices such as reforestation were accomplished only when funding and time permitted. One purpose of the proposed timber management plan is to adopt a full spectrum of timber management practices. The proposal will ensure that any funding cuts would be made proportionately across the board. Harvest levels would not be maintained unless sufficient funding is available for all necessary timber management activities.

CONTEXT

It is important to note that the BLM harvest volumes and timber management acreages discussed in this EIS make up a very small portion of the total for the entire EIS area. The overall significance of past as well as proposed timber management activities is minimal. Tables 1-1 and 1-2 serve to put this into perspective.

This Environmental Impact Statement is prepared in compliance with the National Environmental Policy Act and in specific response to litigation in U.S. District Court, for the District of Columbia, entitled Natural Resources Defense Council, Inc., et al. v. Thomas S. Kleppe, et al., Civil No. 75-1861.

TABLE 1-1

EIS AREA ACREAGES

Administered/Owned	Acres	Percent of Total
Forest Service	8,131,600	58.4%
Private	4,665,183	33.5%
State	761,000	5.5%
BLM	271,425	1.9%
Other Federal	95,000	.7%
Totals	13,924,208	100.0%

SOURCE: BLM, Coeur d'Alene District, URA 1979.

TABLE 1-2

EIS AREA TIMBER HARVEST
ANNUAL AVERAGE FOR TEN-YEAR PERIOD (1969-1978)

Agency/Owner	Average Annual Volume (Million Board Feet)	Percent of Total
Forest Service	529.2	40.6%
Private	611.5	46.8%
State	142.2	10.9%
BLM	12.5	1.0%
Other Federal	8.5	0.7%
Totals	1,303.9	100.0%

SOURCE: USDA, Forest Service 1979.

CHAPTER 2

ALTERNATIVES INCLUDING THE PROPOSED ACTION

CHAPTER 2
ALTERNATIVES INCLUDING THE PROPOSED ACTION

GENERAL DESCRIPTION OF THE ALTERNATIVES

PROPOSED ACTION

The proposed action is a 10-year timber management plan for public lands administered by the Bureau of Land Management (BLM), Coeur d' Alene District. This timber management plan proposes an annual harvest of approximately 2.6 million cubic feet of timber (14.05 million board feet Scribner Log Rule) to be harvested from 80,489 acres of land available for timber production. Harvest would be accomplished by clearcutting, two-stage shelterwood cutting, and single-tree selection cutting. Included in the proposal are three levels of timber management (intensive, extensive, and custodial) which are based on varying usage of the following timber management practices:

- Timber harvest
- Equipment applications
- Slash disposal
- Site preparation
- Reforestation
- Precommercial thinning
- Commercial thinning
- Fertilization

The proposal also includes the construction of roads to provide a means of moving logs from the cutting area loading site to a mill or other market destination.

The proposed land use allocations of the Management Framework Plan (MFP) have been used by the Coeur d'Alene District staff to prepare a sample 3-year timber sale plan. This plan is located in Appendix 2-1 and includes estimates of the following:

- Location of sale
- Timber harvest volume
- Road construction or improvement in miles
- Road easements required
- Roads to be closed following harvest in miles
- Harvest method (eg. clearcut, shelterwood, etc.) in acres
- Logging (yarding) method in acres
- Slash disposal and site preparation in acres

A sample 3-year forest development plan has also been generated and is contained in Appendix 2-2. This plan contains estimates of the following data:

- Location of proposed areas for development or treatment
- Site preparation acres and methods
- Areas proposed for planting
- Precommercial thinning acres
- Commercial thinning acres
- Fertilization acres

These two plans illustrate the types of activities which are to be carried out during the proposed 10-year timber management plan period. However, it should be noted that information contained in these 3-year plans is subject to change during preparation of the final sale and development plans as more site-specific data becomes available. The general geographic locations for the sample timber sale plan and forest development plan are identified on the large map in the back cover packet.

The proposed annual harvest (14.05 million board feet) is approximately 2.77 million board feet more than the annual average for the past 10 years. In preparing this environmental impact statement (EIS), it has been assumed that full funding would be available to accomplish the chosen alternative. Final decisions concerning land use allocation and timber management activities cannot be made until 30 days after the final EIS has been filed with the Environmental Protection Agency (EPA).

OTHER ALTERNATIVES

In addition to the proposed action, five other alternatives will be analyzed in this impact statement. Alternative A (Non-Commodity Emphasis) and Alternative B (Commodity Emphasis) were developed along with the proposed action during preparation of the MFP. Alternative C (No-Action) and Alternative D (Accelerated Harvest of Overmature Timber) are required by policy for inclusion in timber management impact statements. Alternative E (Transfer of Additional Lieu Lands) is a possible alternative which would remove additional lands from BLM administration. A brief description of each alternative follows:

Alternative A (Non-Commodity Emphasis)

Alternative A emphasizes non-commodity values and enhancement of the natural environment. The active intrusion of man is minimized while the protection of water, air, visual quality, dispersed recreation opportunities, wildlife habitat, and cultural resources is maximized. Only a limited amount of land would be allocated for timber production, and many constraints would be placed on management practices. Fertilization would only be applied to a limited amount of acreage. Under this alternative, an annual harvest of approximately .6 million cubic feet of timber (3.23 million board feet) would be realized from 19,685 acres of land available for timber production.

Alternative B (Commodity Emphasis)

Alternative B emphasizes the production of commodity resources including timber. Production is the major goal with consideration of non-productive resources generally occurring only where required by law or where such protection would improve the productivity of, in this case, timber. Under this alternative, 89,333 acres would be allocated to timber production. Approximately 3.02 million cubic feet (16.61 million board feet) of timber would be harvested annually.

Alternative C (No-Action)

Alternative C is the no-action alternative which would continue the current level of timber management. Under this alternative, approximately 2.05 million cubic feet (11.3 million board feet) of timber would be harvested from 86,103 acres available for timber production. No fertilization, very little reforestation planting, and only limited thinning would take place.

Alternative D (Overmature Accelerated Harvest)

Alternative D would include the provisions of the proposed action but would increase production in the short term by 10 percent (1.41 million board feet annually) for 40 years through the harvest of overmature timber. A deviation from even-flow nondeclining harvest levels would occur for 40 years; however, a regulated forest and a return to even-flow would occur during the 5th decade. This accelerated harvest would not exceed the sustained yield capacity of the forest. These provisions are contained in the President's Memorandum for the Secretary of the Interior dated June 12, 1979. Under this alternative, the total annual harvest would be 15.46 million board feet for 40 years which would drop back to 14.05 million board feet after the 40th year of harvest. The lands allocated for timber production would be the same as for the proposed action (80,489 acres). Should future computer calculations indicate a need, 10 and 20 year accelerated harvest periods will be assessed in the final EIS.

Alternative E (Transfer of State Lieu Lands)

Alternative E would reduce the amount of land available for timber management by BLM through transfer to the State of Idaho under the Lieu Selection process. The proposed action already excludes approximately 8,000 acres of land previously approved for transfer to the state. Subsequent to these approvals, the State of Idaho applied for approximately 11,000 additional acres. This would result in a total reduction from BLM administration of about 19,000 acres. The majority of these lands (95%) are productive forest lands. Under this alternative, an annual harvest of 11.07 million board feet would be realized from 70,087 acres of land available for timber production. State Lieu Selection lands are identified on the large map in the back cover of this document. The final determination of which lands would be transferred to the State would be made through further negotiations between BLM and the State of Idaho.

A summary of timber management activities for the proposed action and alternatives is contained in Table 2-1. Table 2-2 is a comparison of the impacts which would result from implementation of the proposal and alternatives.

AUTHORITY

Most BLM activities are governed and authorized by the Federal Land Policy and Management Act of 1976 (90 Stat. 2743, 43 USC 1701). This law established policy for BLM administration of public lands under its jurisdiction. Five provisions of the Act have particular application to this proposal:

1. Broad management authority under the principles of multiple use and sustained yield.

2. Periodic and systematic inventory of the public lands and the resources they contain.

3. Comprehensive land use planning.

4. Protection of scientific, scenic, historical, ecological, environmental, air and atmosphere, water resource, and archaeological values.

5. Management of lands in a manner that recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber.

The BLM also follows the policy guidelines for timber management contained in the Senate Subcommittee on Public Lands report of 1972 entitled, "Clearcutting on Federal Timberlands." Allowable harvest levels, timber harvesting limitations, and timber sale contracts are three major subject areas contained in the report and are briefly summarized here:

ALLOWABLE HARVEST LEVELS

- Allowable harvest on Federal forest lands should be reviewed and adjusted periodically to assure that the lands on which they are based are available and suitable for timber production.

- Increases in allowable harvests based on intensified management practices such as reforestation, thinning, tree improvement, and the like should be made only upon demonstration that such practices justify increased allowable harvests and only when there is assurance that such practices are satisfactorily funded from continuation to completion.

- If planned intensive measures are inadequately funded and thus cannot be accomplished on schedule, allowable harvests should be reduced accordingly.

TIMBER HARVEST LIMITATIONS

- Clearcutting would not be used where: 1) soil, slope, or watershed conditions are fragile and subject to major loss; 2) there is no assurance that the area can be adequately restocked within five years after harvest; 3) esthetic values outweigh other considerations; and 4) the method is preferred only because it will give the greatest dollar return or the greatest unit output.

- Clearcutting would only be used where: 1) it is determined to be silviculturally essential to accomplish the relevent forest management objectives; 2) the size of clearcut blocks, patches, or strips are kept at the minimum necessary to accomplish silvicultural and other multiple use forest management objectives; 3) a multi-disciplinary review has first been made of the potential environmental, biological, esthetic, engineering, and economic impacts on each sale area; and 4) clearcut blocks, patches, or strips are, in all cases, shaped and blended as much as possible with the natural terrain.

TIMBER SALE CONTRACTS

- Federal timber sale contracts would contain requirements to assure that all possible measures are taken to minimize or avoid adverse environmental impacts of timber harvesting even if such measures result in lower net returns to the Treasury.

LAND USE ALLOCATION

Allocation of land for timber production and other uses is made through the Bureau's land use

TABLE 2-1

SUMMARY OF ALTERNATIVES INCLUDING THE PROPOSED ACTION FOR DECADE

	Proposed Action	Alt. A Non-Commodity	Alt. B Commodity	Alt. C No-Action	Alt. D Overmature Accel.Harvest	Alt. E Transfer of State Lieu Lands
Timber Management Acres	80,489	19,685	89,333	86,103	80,489	70,087
Harvest Volume:						
Cubic Feet (million)	25.5	5.87	30.2	20.5	28.1	20.13
Board Feet (million)	140.5	32.3	166.1	112.8	154.6	110.7
Operations & Treatments						
Roads (miles)						
New Mainline Construction	37.7	8.7	44.5	74.2	41.5	34.6
Temporary Spurs	122.9	28.3	145.0	100.7	135.2	85.2
Improvement	70.0	16.1	82.6	18.7	77.0	46.2
Closures	164.5	37.9	194.2	60.0	181.0	104.0
Cutting Practices (Acres):						
Clear Cut	593	137	700	2,086	652	450
Partial Cut-Regeneration	9,154	2,105	10,801	8,606	10,069	7,338
Partial Cut-Final	559	128	660	0	615	336
Yarding Methods (Acres):						
Ground based	7,792	1,792	9,194	7,401	8,570	5,809
Cable	8,122	1,869	9,585	2,732	8,934	3,856
Slash Disposal (Acres):						
Pile and Burn	6,539	1,504	7,701	2,985	7,193	4,135
Burn in Place	593	137	700	1,800	652	450
Site Prparation (Acres):						
Burn	1,315	303	1,552	40	1,447	879
Mechanical Scarify	349	80	412	10	384	283
Planting (Acres)	2,275	523	2,684	984	2,502	1,531
Precommercial Thin (Acres)	1,516	349	1,789	556	1,668	1,073
Commercial Thin (Acres)	5,608	1,290	6,617	0	6,169	3,540
Fertilization (Acres)	2,488	573	2,936	0	2,737	2,045

SOURCE: BLM, Coeur d'Alene District, 1980.

TABLE 2-2
SUMMARY OF IMPACTS BY ALTERNATIVE (10-YEAR PERIOD, UNLESS OTHERWISE NOTED)

		Changes by Alternatives					
Environmental Element	Current Situation	Proposed Action	Alt. A Non-Commodity	Alt. B Commodity	Alt. C No-Action	Alt. D Accel. Harvest	Alt. E State Lieu
Air Quality:							
Particulate emissions from prescribed fires and unpaved roads (tons per year)	2,333	+ 424	- 756	+ 700	+ 894	+ 577	+ 145
Soil:							
Soil loss due to roads, yarding, slash disposal, burning (tons)	410,000	+13,767	+ 3,230	+16,175	+11,428	+15,044	+ 9,923
Water:							
Water yield (Ac.Ft./Yr.)	305,000	+ 405	+ 93	+ 477	+ 380	+ 445	+ 308
Equivalent flow (cfs)	422	+ 0.56	+ 0.13	+ 0.66	+ 0.53	+ 0.62	+ 0.43
Sediment yield reaching streams (tons)	160,000	+ 5,500	+ 1,300	+ 6,500	+ 4,600	+ 6,000	+ 4,000
Vegetation:							
Complete elimination of vegetation (acres)	N/A	+ 137	+ 32	+ 172	+ 270	+ 151	+ 126
Initiation of early successional stages (acres)	N/A	+ 6,361	+ 1,463	+ 7,507	+ 7,250	+ 6,997	+ 4,403
Damage or destruction to surface vegetation due to yarding	N/A	+ 1,869	+ 429	+ 2,205	+ 1,626	+ 2,055	+ 1,240
Terrestrial Animals:							
Loss of habitat (acres)							
Elk	180,000	- 561	- 129	- 662	- 611	- 617	- 418
White-tailed deer	100,000	- 393	- 91	- 464	- 428	- 433	- 293
Mule deer	150,000	- 468	- 108	- 553	- 510	- 515	- 349
Black bear	216,000	- 578	- 133	- 682	- 630	- 636	- 431
Snag dependent species	197,000	- 1,927	- 444	- 2,274	- 2,099	- 2,120	- 1,438
Upland game	197,000	No habitat would be lost; however, some alteration would occur.					
Aquatic Species:							
Loss of fish habitat (feet) caused by new crossings of Class I streams	1,320,000	- 160	- 40	- 200	- 160	- 200	- 120
Economics:							
Employment (jobs)	65,584	+ 42	- 122	+ 80	0	+ 59	- 30
Income (thousands of dollars)	720,740	+ 576	- 1,678	+ 1,108	0	+ 869	- 436
Energy:							
Consumption (million Btus)	N/A	1,300.4	310.4	1,599.3	1,056.6	1,588.4	1,023.4

SOURCE: BLM, Coeur d'Alene District, 1980.

planning system. The Management Framework Plan (MFP) portion of the plan describes the various resource uses which are permissible after consideration of appropriate guidance; technical data about the resources and their uses; public needs; and other inputs to the process. In addition, it describes the constraints on the utilization of those resources for protection and enhancement of the environment; stability of dependent communities; and other objectives of management. The MFP was prepared by an interdisciplinary team at the district office level, working in close coordination with a variety of groups and interests in an organized public participation process. Following the preparation of the MFP, program activity plans are prepared for certain resources.

The timber management program is an activity plan which details how the timber resources would be managed to achieve the objectives and meet the constraints developed in the MFP. It is important to note that it is impossible to determine the full range of coordination and mitigative effort relating to environmental matters that have occurred in the planning process by referring to the timber management plan alone. The timber management plan details the program that will be carried out after adjustments and constraints have been imposed as a result of blending the timber resource inputs with multiple use and environmental considerations determined during the planning process. The plan also details the efforts that will be made for environmental protection of lands available for timber production; however, the MFP process may have already removed certain areas of timberland from consideration for timber production due to environmental or other use considerations.

In order to get a complete picture of both environmental impacts and mitigative efforts, it is essential to view the planning process as a whole and not strictly concentrate on any particular activity plan. Major environmental impacts have been eliminated or greatly mitigated through the land use allocation process. Those management guidelines developed through the planning process which apply to timber management are summarized in the Management Guidelines section of this chapter.

In developing its MFP, the Coeur d'Alene District strove to prepare a land use plan that is responsive to environmental protection needs while at the same time allowing uses which are desired by the public and beneficial to local economies. Table 2-3 summarizes the land allocations tentatively made in the MFP for the proposed action and alternatives A and B. Complete planning documents and conflict resolution overlay maps are available for review at the BLM, Coeur d'Alene District Office in Coeur d'Alene, Idaho. Table 2-4 summarizes land allocations from productive forest lands for all alternatives including the proposed action.

INVENTORY PROCEDURES AND ALLOWABLE CUT DETERMINATION

INVENTORY

Extensive

In 1975, the forest resource of the Coeur d'Alene District was extensively inventoried. The extensive inventory statistically measured and quantified the physical and biological condition of the forest. It simply told what timber existed but not its precise location. A double sampling system was used to establish field plot locations.

The first step in the extensive inventory was to identify the timber production land base on the Master Title Plats (MTP) and obtain an accurate acreage count. Broad strata were then developed where feasible that combined forested areas into groups of similar stand characteristics such as tree heights, crown densities, and species. The stratification was done using aerial photos; therefore, only those characteristics that could easily be seen on aerial photos were used. The strata were developed from existing type maps, recent timber sale data, local knowledge of field conditions, etc.

Based on the total acreages and number of strata, a total number of photo interpretation (PI) points were selected to obtain a field sampling accuracy to within 5 percent of the total area and 10 percent of the volume. A grid of pins was prepared to prick the aerial photos

TABLE 2-3
ALTERNATIVE LAND USE ALLOCATIONS FOR ALL DISTRICT LANDS (271,425 acres)
MANAGEMENT FRAMEWORK PLAN STEP 2

Activity	Acreage Allocations by MFP Alternatives		
	Alternative 1[1]	Alternative 2[2]	Alternative 3[3]
Timber Management (Intensive-Extensive)	19,685	80,489	89,333
Acres Leased for Livestock Grazing	113,715	119,209	119,209
Intensive Wildlife Management Areas	13,740	13,338	7,401
Roadless Areas	53,001	53,001	53,001
Approved State Lieu	8,078	8,078	8,078
Research Natural Area	3,360	3,360	3,360
Cultural/Historic	787	787	787
Scenic-Visual[4]			
Resource Management:			
Class I	57,206	52,858	51,130
Class II	122,297	55,028	36,957
Class III	40,389	96,179	98,741
Class IV	51,533	67,360	84,597
Recreation Opportunity Classes:[5]			
Primitive	0	0	0
Semi-primitive Non-motorized	59,851	47,269	39,006
Semi-primitive Motorized	55,919	32,636	25,394
Roaded Natural	124,996	160,480	176,401
Semi-urban and Urban	30,659	31,040	30,624

Note: These are multiple-use allocations from the MFP Step 2. The columns will not total or balance since resource uses overlap in many cases.

[1] These allocations make up basis for EIS Alternative A (non-commodity emphasis).

[2] These allocations make up basis for EIS Proposed Action.

[3] These allocations make up basis for EIS Alternative B (commodity emphasis).

[4] These acreages cover the entire district (271,425 acres). See Chapter 3 for descriptions of VRM Classes.

[5] These acreages cover the entire district (271,425 acres). See Chapter 3 for descriptions of Recreation Opportunity Classes.

SOURCE: BLM, Coeur d'Alene District, MFP-2.

TABLE 2-4

ALTERNATIVE LAND USE ALLOCATIONS FOR PRODUCTIVE FOREST LANDS

(Productive Forest Acres as Based on 1979 Timber Production Capability Classification (TPCC) - 157,455)

Allocation	P/A	Alt. A Non Commodity	Alt. B Commodity	Alt. C No-Action	Alt. D Overmature Accel.Harvest	Alt. E Transfer of Add'l Lieu Lands
Required by Law or Policy						
Roadless acres	24,568	24,568	24,568	24,568	24,568	24,568
Approved State Lieu selections	7,751	7,751	7,751	7,751	7,751	18,303
Subtotal	32,319	32,319	32,319	32,319	32,319	42,871
Resource Allocations[1]						
Timber management	80,489	19,685	89,333	86,103	80,489	70,087
Visual (scenic)	15,152	77,582	8,158	10,535	15,152	15,152
Recreation	7,757	6,026	8,733	7,261	7,757	7,615
Cadastral survey needs[2]	7,490	5,603	9,958	7,490	7,490	7,490
Wildlife[3]	7,257	7,526	3,102	6,943	7,257	7,249
Livestock grazing	5,240	7,096	3,377	5,240	5,240	5,240
Lands action	1,087	1,087	1,087	1,087	1,087	1,087
Cultural resources	477	477	477	477	477	477
Adverse Location	187	54	911	0	187	187
Total	157,455	157,455	157,455	157,455	157,455	157,455

SOURCE: BLM, Coeur d'Alene District, 1980.

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[1] These acreages indicate a dominate use by a single resource; in actuality, uses overlap and intermingle in a multiple-use manner.

[2] Acreages where required surveys are not anticipated during the decade.

[3] Includes terrestrial and aquatic habitats. Stream and lake buffers are also included in these acreages.

in a systematic fashion. The grid was adjusted for the scale of the photos and the computation of the number of PI points as previously selected. Each PI point that fell on public land was interpreted on the aerial photo and placed into its proper strata.

The number of field plots necessary to achieve the required accuracy was then determined, after which a computer was used to randomly select the plots to be field sampled. Field plots were then consecutively numbered and established in accordance with the instructions found in the 1974 BLM Extensive Inventory Handbook. After all field plots were measured, a computer was used to summarize tree, plot, and forest condition data.

Timber Production Capability Classification (TPCC)

The TPCC, an intensive inventory designed to determine the timber production land base, was finished in February 1980. Its purpose was to identify the site-specific location of three basic production classifications: non-forest, non-productive forest, and productive forest. Productive forest was further classified into problem and non-problem sites.

The inventory was done using existing aerial photography. The actual classifications were delineated on the photographs, and a helicopter was used for rapid field checking. If after flying, questions still existed about the classification, an on-the-ground field check was made.

After varifying the classification, a write-up was made which gave each classification an identification number, described its characteristics, and also made a recommendation as to which class it should be placed in. The classification was then transferred to 1:12000 scale maps for acreage counts. All acreages were balanced to the MTP acres by section.

The classifications were reviewed by the area manager, the district staff forester, and staff soil scientist. Recommendations were then accepted by the district manager as being an accurate reflection of the forest land base in the area. Table 2-5 itemizes the TPCC designations by category and acreage.

Land Use Planning

In 1979, the extensive and TPCC inventories were combined to provide the data base for land use planning and allowable cut computations. The TPCC was used to define the timber production base. The extensive inventory field plots that fell in that base were then used to quantify the physical and biological condition of the forest.

ALLOWABLE CUT DETERMINATION

The BLM normally uses SIMIX (Bergsvik 1968), a computerized forest simulation model, to calculate allowable cuts. SIMIX computes a harvest rate based on present inventory and projected growth from intensive forest management practices. It allows a mixture of management practices but must be given yield tables for the practices and told what practices to apply, to what acres, and when to apply them.

Yield tables for SIMIX are being developed using the Northern Rocky Mountain version of PROGNOSIS (Stage 1973). PROGNOSIS is a computer model which makes a prognosis of the course of development that a forest stand is expected to follow under a given management prescription. The internal growth curves of the model are based on tree and stand growth data from north Idaho, western Montana, and northeastern Washington. The model then calibrates these growth curves using the past growth of the stand being modeled.

Field plots from the extensive inventory are being grouped to provide the stands to be modeled by PROGNOSIS. The resulting growth curves will be integrated to form the yield tables for SIMIX.

At this time, the growth curves necessary to develop yield tables have not been satisfactorily formulated. Should they become available in the near future, the SIMIX model will be used to verify the allowable cut volume calculations presented in this document. Any changes will be reflected in the final EIS. No major changes are anticipated.

For this EIS, allowable cut calculations were made using Kemp's Formula. This formula

TABLE 2-5

TIMBER PRODUCTION CAPABILITY CLASSIFICATION - 1979

Category	Acres
Productive forest lands in base-	
Non-problem sites[1]	118,908
Restricted use sites[2]	38,547
	(157,455)
Productive forest lands excluded from base[3]	12,792
Non-productive forest lands[4]	27,180
Non-forest land[5]	73,998
Total lands administered by BLM	271,425

[1] Nonproblem sites are productive forest sites characterized by stable soils and bedrock. They can be logged by normal ground based and cable practices, and reforestation can be established within 5 years after final harvest using normal techniques.

[2] Restricted use sites are productive forest sites that need special logging practices or reforestation techniques to preserve soil productivity or ensure reforestation of the site within 5 years after final harvest.

[3] Productive forest lands excluded from the base are productive forest lands wherever the application of special logging practices or reforestation techniques would still result in degradation of the site or failure of the area to reforest within 5 years after harvest. These lands are not included in the allowable cut base.

[4] Nonproductive forest land is not capable of producing 20 cubic feet of wood per acre per year or is only capable of producing a non-commercial species of trees.

[5] Nonforest lands are incapable of being 16.7 percent stocked with forest trees or are lands developed for nontimber uses.

SOURCE: BLM, Coeur d'Alene District, 1980.

permits calculation of allowable cut volumes without computer simulation. It statistically weighs the acreage of all timber age classes, divides by the rotation age times the number of age classes used, and multiplies by the average volume per acre of sawtimber. This formula is also used by the U. S. Forest Service and Idaho Department of Lands to calculate allowable cuts in northern Idaho. For our calculations, acreages by age class were developed from our extensive timber inventory. Sawtimber volume was obtained from the inventory and factored to reflect gains resulting from intensive management practices. The aggregate gain averaged 20 percent.

COMPONENTS OF ALTERNATIVES INCLUDING THE PROPOSED ACTION

LEVELS OF TIMBER MANAGEMENT

Three levels of timber management were developed during preparation of the MFP (intensive, extensive, and custodial). These levels of management would be applied to varying acreages under each alternative. The following is a brief description of these practices. Table 2-6 shows the breakdown in acres by management class for all the alternatives. Additional information is in the Operation Model portion of this chapter.

Intensive Timber Management

Lands classified for intensive management would be managed to maximize timber production on a sustained yield basis. Timber harvest would be the primary goal of management activities on these lands.

Timberlands placed in the intensive category are suitable for continuous timber production with reasonable assurance of successful results from the application of intensive timber management practices. Generally, these lands are TPCC rated "non-problem" or "restricted productive" which would satisfactorily respond to thinning, fertilization, and planting. Elevations are usually below 5,000 feet with slopes less than 60 percent. The following practices would be applied to these intensively managed areas:

TABLE 2-6

LEVELS OF TIMBER MANAGEMENT (ACRES)

	Proposed Action	Alt. A Non-Commodity	Alt. B Commodity	Alt. C No-Action	Alt. D Overmature Accel.Harvest	Alt. E Transfer of State Lieu Lands
Intensive	45,727	12,514	57,000	80,489	45,727	38,216
Extensive	34,762	7,350	32,333	0	34,762	31,871
Custodial	76,966	137,591	68,122	76,966	76,966	76,966
Total	157,455	157,455	157,455	157,455	157,455	147,053[1]

SOURCE: BLM, Coeur d'Alene District, 1980.

[1] An additional 10,402 acres of productive forest land would be transferred to the State of Idaho under the Lieu Selection process.

Timber Harvest

Any harvest method, including clearcutting (removal of the entire stand in one cut), would be permitted on northeast, north, or northwest aspects, where not restricted by TPCC. The average size for a clearcut based on a 10-year period would be 20 acres. The maximum size would not exceed 60 acres for any single clearcut unit.

On all other aspects (west, south, and east), only partial or selective cutting methods would be used. Seed tree and shelterwood systems would be the most common harvest methods on these aspects. Both methods remove the stand in two cuts spaced about 10 years apart. In the seed tree system, 80 to 90 percent of the stand is removed with the first cut compared to 50 to 60 percent for shelterwood systems. The latter is used in areas where heat and drought pose problems. Slash disposal would take place after the first cut to prepare the seedbed for natural regeneration. The final cut is made after seedling establishment.

Individual tree selection would be used as required on TPCC restricted areas. Individual tree selection removes selected trees from the stand. It affords excellent site protection because it provides for continuous regeneration of the forest. Individual tree selection results in a stand with mixed ages. Individual tree selection cuts would be spaced 20 to 30 years apart.

Mortality salvage (removal of individual dead or dying trees while they still have commercial value) would usually be done in conjunction with a timber sale or sold under a timber sale contract where merchantable quantities of material are present.

Equipment

On non-problem and problem reforestation sites, as determined by TPCC, with slopes less than 35 percent, any acceptable yarding system, site preparation method, and slash disposal method would be permitted.

Where slopes exceed 35 percent or on TPCC-identified problem sites, any acceptable yarding system except ground based (i.e., tractors and rubber tired skidders) would be used. Slash would be disposed of by lopping and scattering, hand piling, burning, or yarding. Site preparation would be done by hand or controlled burns.

Slash Disposal

Slash residue resulting from final harvest cutting would be reduced to a rating of 40 points or less based on the Idaho Forest Practices Act (IFPA) rating system. This would be done to reduce fire hazard and prepare the site for reforestation. Slash resulting from other intensive practices would be reduced to 80 points on the IFPA rating system mainly for fire protection. At least 80 percent of the slash within 50 feet of roads and landings would be piled and burned.

Site Preparation

The primary objectives of site preparation activities would be to reduce competition between future established trees and other vegetation, and to expose mineral soil to encourage the establishment of natural regeneration. The preparation of sites for reforestation would be done on non-stocked areas or areas where harvest has occurred. The equipment restrictions described previously would apply.

In many cases, herbicides have been shown to be an effective means of controlling competing vegetation. However, the forest development plan identified only 70 acres of commercial timber lands where the application of herbicides would be beneficial. Due to this limited acreage, the application of herbicides is not considered in this document. Should future site specific inventories indicate a need for the use of herbicides, the environmental consequences of their use would be analyzed and documented.

Reforestation

All final harvest and reforestation planting projects would be designed to meet stocking standards on at least 90 percent of the treated area within 5 years. Species to be favored would be based on factors such as habitat type, elevation, industry preferences, and ability to obtain quality seedling stock. Species diversity would be encouraged on all areas where possible.

All clearcut areas would be planted with acceptable bare root or containerized stock. Partial or selectively cut areas would rely on natural regeneration when acceptable and desirable seed sources exist; otherwise, they would be planted. Artificial shade would be provided as needed. Planted areas would meet stocking standards on first and third year survival surveys. Naturally regenerated areas would meet stocking standards on the third year survival survey. If any areas fail to meet the stocking standards, they would be planted in order to bring them up to standards within two years.

Precommercial Thinning

Precommercial thinning, sanitation thinning, and hand slashing removes unmerchantable surplus trees or brush to provide more light, moisture, and nutrients for the trees remaining. The main objective of these practices is to produce merchantable volume and value sooner than in untreated stands. Precommercial thinning would be done prior to crown closure and any expression of dominance or in the case of ponderosa pine, when the Mean Annual Increment (MAI) begins to decrease. Precommercial thinning would usually be done in stands 10 to 20 years of age.

Individual tree vigor plus the criteria used for reforestation would determine the selection of leave trees. Competing trees and vegetation would be eliminated mechanically, by hand, or by prescribed burning. The number of trees left per acre would range from 200 to 450 with spacing based on habitat type, species, and tree size.

Sanitation thinning of stagnated stands over 20 years of age would follow the guidelines for precommercial thinning but would emphasize the leaving of dominant, co-dominant, vigorous, and healthy trees.

Commercial Thinning

Commercial thinning removes merchantable surplus trees to increase light, moisture, and nutrients available for the trees remaining. Stands of commercial size trees which exceed 80 percent stocking would be thinned before crown closure or in the case of Ponderosa pine, when the MAI begins to decrease. This would usually occur in stands 50 to 70 years of age. Selection of leave trees would be based on spacing, health, vigor, and degree of dominance. Spacing would be based on habitat type, species, and tree size.

Fertilization

Fertilizer would be applied at a rate of 150 to 300 pounds of nitrogen per acre. Soil tests would determine if application of phosphorus, potassium, or other trace elements are needed and the rate at which they would be applied. Application would normally be made aerially at 10-year intervals, starting 2 years after precommercial thinning and ending at age 80.

Extensive Timber Management

Lands classified for extensive timber management would be managed for timber production on a sustained yield basis; however, few intensive management practices would be applied. Timberlands placed in the extensive category generally have steeper slopes (60%+) than those lands proposed for intensive managment. Often times, these areas are in the alpine zone (5,000 feet or greater in elevation). In many cases, timberlands have been categorized as extensive management areas due to other resource needs (wildlife, scenic, etc.) which would prohibit full utilization of the practices proposed for intensively managed lands. The following practices would be applied to extensively managed areas. No other practices would normally be applied to extensively managed lands:

- Timber Harvest: Same allowances and constraints as Intensive Management.

- Equipment: Same as Intensive Management.

- Slash Disposal: Same as Intensive Management.

- Site Preparation: Same as Intensive Management.

- Reforestation: Same as Intensive Management.

- Sanitation Thinning: Sanitation thinning of stagnated stands would be used on those stands which exceed 120 percent of full stocking.

Custodial Timber Management

Lands classified for custodial timber management would not be managed for timber production and would not be included in allowable cut computations. Timber would be removed when necessary to protect or enhance adjacent forest lands or other resource values. Any timber removed would be done in such a way as to afford maximum protection to the site or to accomplish other resource objectives.

MANAGEMENT GUIDELINES

The following guidelines, in keeping with Bureau policy, have been adopted as standard operating procedures for the Coeur d'Alene District. Most of these were developed during the MFP preparation process. Their goal is to mitigate adverse environmental impacts to the lowest possible level. With the exception of alternative C, these guidelines would be applied to any and all actions proposed by the alternatives. Under alternative C (no-action), impact mitigation would be developed on a site-specific basis. Where the other alternatives would apply the management guidelines as standard procedures, actions under alternative C would not automatically be constrained by these guidelines. In reality, however, all of these guidelines would be followed to some degree in alternative C.

Threatened or Endangered Species

In accordance with policy and law (BLM Manual 6840, Endangered Species Act of 1973), no actions would be taken which would adversely affect the continued existence of any Federally-listed threatened or endangered animal or plant species. The BLM also complies with Idaho laws pertaining to state-listed species including "sensitive" species. A threatened/endangered species clearance would be part of the site-specific environmental assessment (EA) prepared for each timber sale or other activity. If any threatened/endangered species (listed or proposed) or critical habitats are located that would be affected, formal consultation with the U. S. Fish and Wildlife Service would be initiated by BLM as prescribed by Section 7 of the Endangered Species Act.

Cultural Resources

Special surveys and clearances are required to protect cultural resources. A Class III (complete survey) cultural resources inventory is required of all areas to be subjected to ground manipulation activities. The results of this inventory are used to generate a cultural clearance. In addition to the clearance procedure, the cultural review provides cultural resource input for consideration in a site-specific environmental assessment.

Bureau projects possibly affecting areas of historical value will be preceded by a search through the cultural and historical site listings currently on file with the State Historic Preservation Officer. The latest edition of the National Register of Historic Places and monthly supplements will be consulted prior to undertaking any proposed actions. The BLM will consult with the Idaho State Historic Preservation Office concerning the eligibility of any site located and the possible effects on it from any proposed actions. In cases where there may be an effect from proposed activities, BLM will comply with Section 106 of the National Historic Preservation Act (BLM policy, National Historic Preservation Act, NEPA, Executive Order 11593, 36 CFR Part 800).

If any archaeological resources are encountered during a timber harvest or associated activities, operations will cease at the discovery site and a professional archaeologist will be consulted to determine the significance of the material. Depending on this determination, activities would be resumed, modified, or curtailed.

Roadless Areas

Lands currently designated as "roadless" will not be allocated for any use until the complete wilderness inventory and study required by Section 603 of the Federal Land Policy and

Management Act of 1976 (FLPMA) is completed and congress has acted. About 53,000 acres of the EIS area are in this category, 24,600 acres of which are classed as productive forest lands.

Area of Critical Environmental Concern

An Area of Critical Environmental Concern (ACEC) is an area where special management attention is required to protect and prevent irreparable damage to important or unique resources. No proposed ACECs would be affected by implementing any alternative.

Wildlife Protection

1. Big game (deer, elk) habitat would be protected by adhering to the following road closure guidelines:

- Critical and important winter range would be closed to vehicles from December 1 to March 30 each year. Roads will be closed through the use of vehicle barriers (as shown on Figure 2-1) or gates.

- In areas identified as heavy use, fawning, rut, and lick areas, all roads except main haul roads would be closed to public vehicular access from April 1 to November 30 each year.

2. The guidelines of the Elk Habitat Coordinating Requirements will be followed for all actions. Key portions of that document are summarized in Appendix 2-3.

3. The following key points of the district snag management guidelines will be followed for all timber sales:

- Snag management will be practiced on at least 60 percent of any timber harvest area.

- Maintain a minimum of two large DBH (14" or greater) snags per acre.

- Where snag densities are below the desired level, non-merchantable and/or diseased trees will be girdled to provide snags.

- In firewood cutting areas, "leave" snags would be marked.

4. Cutting units where more than 60 percent of the cover is to be removed would be shaped so that adequate hiding cover is available within 330 feet from any point within the cutting unit. The area must be bordered by cover of not less than 1.5 sight distance. A sight distance is the distance at which a deer or elk is hidden from view within any cover type.

5. All dead-end roads and roads with an expected duration of BLM management use of 5 years or less would be closed. New roads remaining open following harvest will be buffered by vegetation to 1.5 sight distance.

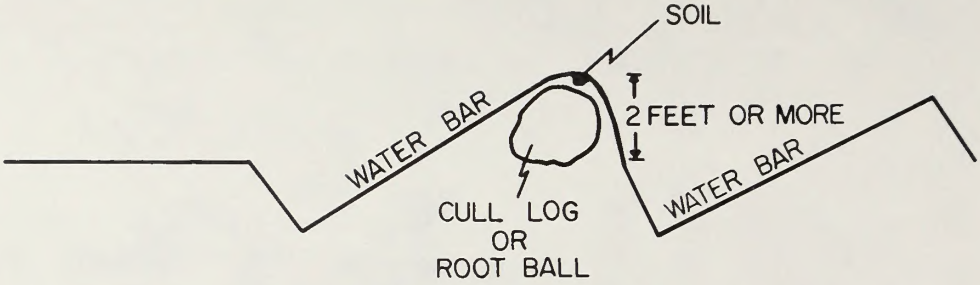
6. The district buffer guidelines discussed below would be followed to maintain stream thermal cover and wildlife travel lanes adjacent to waterways.

7. Active raptor nests would be buffered by a 100-yard radius non-disturbance zone.

Buffers

The district buffer guidelines would be followed to provide stream and streamside vegetation buffers to protect water quality, aquatic habitat, and wildlife habitat in the district. The guidelines have been developed from various sources based on protection needs and effects by particular actions. The proposed revisions of the Idaho Forest Practices Rules developed by the State 208 Non-Point Source Pollution Control Program (IDHW 1979) are considered as the minimal guidelines. It should be recognized that specific widths must be established on a case-by-case basis. If special situations are encountered, the guidelines can be modified by following environmental assessment.

The buffer widths are the distances along the ground and are measured from the high waterline of the stream channels. The stream classes are based on the value of the stream uses. Class I streams include potable water supplies and important fish spawning, rearing, and migration streams. Selected Class II streams include



SOURCE: BLM, Coeur d' Alene District, 1980.

Figure 2-1. Vehicle barrier.

streams of important local stream fisheries or have high potential and important wildlife habitat areas. Class II streams are usually head-water streams or minor drainages with little fisheries value.

Within the buffer strips, management activities are to minimize the wildlife and stream habitat disturbance and protect the soil and vegetative cover to reduce introduction of sediment into the streams. In Class I and Selected Class II streams, no harvest would be permitted in the thermal buffer except to benefit wildlife or improve the stream habitat conditions. In Class II and sediment buffer areas, harvesting is allowed but stream shade must be provided. The logging methods would provide minimal soil disturbance and minimal removal of undergrowth vegetation and non-merchantable trees.

Yarding within buffer zones would be kept to a minimum and yarding through stream channels would be avoided. Full suspension cable corridors in or through the buffer zone could be approved on a case-by-case basis. Felling of trees would be outward from the stream and buffer area. No slash or downed timber would be left in the zone between the channel highwater marks. Table 2-7 shows the basic buffer guidelines indicating buffer location, width, and type.

Visual (Scenic) Resource Values

A visual resource contrast rating would be conducted for all proposed timber management activities. Projects which would reduce scenic quality below established Visual Resource Management (VRM) guidelines as established in the MFP would be modified by design, relocated, or abandoned, if necessary (BLM policy, BLM Manual 8430).

Recreation Opportunity Classes

All acreage in the district has been categorized into various recreation opportunity classes through the MFP planning process. Projects which would alter an established opportunity class would be modified, relocated, or abandoned to meet identified demands for specific recreation opportunities.

Water Quality

Water quality on BLM administered lands would be maintained equal to or above any Federal or State of Idaho legal water quality criteria (BLM Manual 7240; The Federal Water Pollution Control Act Amendments of 1972; The Clear Water Act of 1977; The Safe Drinking Water Act, 1974). Water quality protection is provided under the management practices in accordance with the cooperative agreements with the Idaho Departments of Health and Welfare (Forest Practices), September 26, 1979, and Water Resources (Stream Protection), January 16, 1979.

Floodplains

No actions would be permitted which would

TABLE 2-7
BUFFER GUIDELINES

Location	Width	Type
Lakes	500 ft. (min.)	Wildlife and scenic improvement
Major rivers	500 ft. (min.)	Wildlife and scenic improvement
Class I Streams-		
a. Thermal zone	Tallest tree height or 75 ft.(min.)	Wildlife, thermal and scenic improvement
b. Sediment zone outside thermal zone	4 X slope (%) + 50 ft. or tallest tree height + 25% (min.)	Soil protection
Selected Class II Streams-		
a. Thermal zone	Tallest tree height or 50 ft.(min.)	Wildlife and thermal cover
b. Sediment zone-outside thermal zone	2 X slope (%) + 25 ft.	Soil protection
Class II Streams-		
General protection	75 ft. (37 1/2 ft. each side of stream)	Wildlife and thermal cover

SOURCE: BLM, Coeur d'Alene District, Management Framework Plan.

cause definable adverse impacts to the natural and beneficial functions of floodplains (BLM Manual 7221; Floodplain Management Guidelines for Implementing Executive Order 11988, Federal Register, Volume 43, No. 29, February 10, 1978).

Wetland-Riparian Area Protection

Timber management activities would not occur where they could destroy or degrade wetland-riparian areas (BLM Final Guidelines to Implement Executive Order 11990, Federal Register, Volume 45, No. 25, February 5, 1980).

Burning

All burning would be done to meet specific goals and objectives. Constraints would be prescribed to assure maximum protection of site quality. All forest burning would be planned in conjunction with the local Forest Protection Districts. All prescribed (in-place) burning would be planned according to guidelines in BLM Draft Manual 9215. Prior to burning, weather condition would be checked; the Division of Environment Idaho Department of Health and Welfare would be informed of the planned burn; and a burning permit would be obtained from the local Forest Protection District.

Roads

See Appendix 2-4.

Cadastral Survey

Property lines must be officially established before timber harvest and other management activities can commence. Table 2-4 indicates acreages within the productive forest lands where required surveys are not anticipated during the decade discussed in this document. Almost all of the identified acreages are intermingled with mining claims and privately owned lands in the Silver Belt region of the district.

TIMBER SALE PLANNING

The timber management planning process would start 5 to 7 years before the planned timber sale date. The purpose of the planning process is to produce a timber sale that is consistent with BLM policies and objectives; cause minimal environmental impacts; and reforest an area to BLM standards as quickly as possible.

A preliminary long range timber management plan is developed from the inventory data gathered in the land use planning process and is consistent with the guidelines contained in the MFP. The preliminary plan displays blocks of land proposed for intensive forest management, the proposed practices to be used in the blocks, and obvious transportation routes.

The preliminary plan is evaluated by the area manager and an interdisciplinary team from the district resources staff. The purpose of the evaluation is to determine 1) if the plan is consistent with the MFP, 2) to predict if major impacts may be caused by the project, and 3) to suggest further constraints if they are necessary to reduce impacts.

Blocks of timber that pass the evaluation are placed on the long range timber management plan. The plan is then distributed to interested parties, i.e., prospective timber purchasers, other governmental agencies, environmental groups, and the general public. This public review is intended to coordinate timber sale activities with other forest land users and to discover significant issues.

Next, block (drainage or ownership) development and transportation plans are formulated. These plans are based on field checking and refining the preliminary plans. They also incorporate comments from the interdisciplinary team and other interested parties. During the formulation of these plans, preliminary logging feasibility is investigated and systems chosen that meet the constraints. Road locations that suit the logging system are then explored. In choosing logging systems and road locations, the forester and engineer atttempt to mitigate environmental impacts. Next, a route analysis would be done to evaluate the engineering and economic feasibility of the reasonable routes.

The proposed action for the area development plan is then written using information from the development and transportation plans and the route analysis. The proposed action is subjected to an environmental assessment; cultural resource review; threatened and endangered plants and animals review; and water yield analysis. The findings are documented and returned to the area manager for evaluation. If no significant impacts are predicted and clearances have been generated for cultural and endangered/threatened species, he requests cadastral survey and easements acquisitions and schedules the area for intensive forest inventory.

When the inventory is completed, silvicultural prescriptions are written for the block. The prescriptions have five purposes: 1) to state how the intensive forest practices will meet the objective contained in the MFP, 2) to provide a logical method for analysis of alternative intensive practices, 3) to provide directions for carrying out the intensive practices, 4) to document the scientific basis for the intensive practices, and 5) to provide a record for latter evaluation of the effectiveness of the intensive practices.

Needs for treatments from the prescription and comments from previous reviews are used to select cutting units for the proposed timber sale. Logging plans are then made and field checked. The proposed action for the timber sale is then written, and the proposed roads and unit boundaries are marked on the ground so they can be evaluated. The area manager submits the timber sale proposed action for an environmental assessment and cultural resource and threatened/endangered species review.

These reports are returned to the area manager for evaluation. If no significant impacts are predicted, cadastral survey is completed, and easements have been acquired, the sale is finalized and placed on the annual timber sale plan. The annual timber sale plan is then distributed to interested parties.

After the final unit boundaries and road locations are marked on the ground and the trees to be removed are marked and cruised, the contract is prepared. Special stipulations in the contract are formulated from the proposed actions; environmental assessments; cultural resource clearances; threatened and endangered plants and animals clearance; and water yield analysis. They are written to minimize the impacts of the timber sale.

The timber sale is then appraised, and the contract and appraisal are checked for accuracy and completeness. The sale is then advertised and sold. The standard BLM contract allows a 3-year period for cutting and removing of timber. A bond of 20 percent of the contract value is held by the BLM to insure compliance with the contract provisions.

It is BLM policy to use experienced personnel to inspect and administer contract compliance. Visits to the sale area are made commensurate with the activity being performed, e.g., daily during road grading and surfacing, weekly during cutting and yarding. If a violation of the contract is observed, operations may be suspended until corrections are made. If corrections are not made, the contract may be cancelled, the bond forfeited, and/or legal action taken. When all provisions of the contract are met, the contract is terminated.

If the timber sale included sufficient site preparation for reforestation, the area is left for natural regeneration or planted. If more site preparation is needed, a contract is prepared, awarded, administered, and terminated. The area is then reforested.

Surveys are done the first and third years after the reforestation effort to determine if the area is adequately stocked. If the area does not meet the BLM standards, it is recycled to the stage necessary to attain adequate stocking. After the area is stocked to BLM standards, it is monitored to determine if precommercial thinning is necessary. If the canopy closes or growth slows down, the area is scheduled for thinning, and an environmental assessment is prepared; contract approved and awarded; project administered; and the contract terminated.

Fertilization is then scheduled for the area. This proposal is submitted to cultural and threatened/endangered species reviews and an environmental assessment. A contract is prepared reflecting results of these reviews and assessment as stipulations. The contract is then awarded, monitored, and terminated.

OPERATION COMPONENTS

The operations component section describes a typical operation on the Coeur d'Alene District and summarizes (in the table at the beginning of each section) the 10-year magnitude of each component for each alternative.

Road construction and maintenance

	Alternatives					
	Proposed	A	B	C	D	E
New mainline construction (mi)	37.7	8.7	44.5	74.2	41.5	34.6
Reconstruction/improvement (mi)	70.0	16.1	82.6	18.7	77.0	46.2
Temporary spurs (mi)	122.9	28.3	145.0	100.7	135.2	85.2
Road closures (mi)	164.5	37.9	194.2	60.0	181.0	104.0
Easements (number)	103.0	24.0	122.0	53.0	113.0	79.0
Disturbed (acres)	745.0	171.0	879.0	708.0	820.0	559.0
Rehabilitated (acres)[1]	892.0	205.0	1053.0	568.0	981.0	638.0
Road surfacing	2.0	.5	2.4	22.0	2.2	1.2

[1] Scarified, seeded, mulched, etc. Includes existing roads.

SOURCE: BLM, Coeur d'Alene District, 1980.

Roads are normally constructed as a part of a timber sale contract. Road guidelines are contained in Appendix 2-4. Road locations are usually surveyed and designed prior to the sale of the contract. They are designed to maximize yarding distances and to minimize impacts.

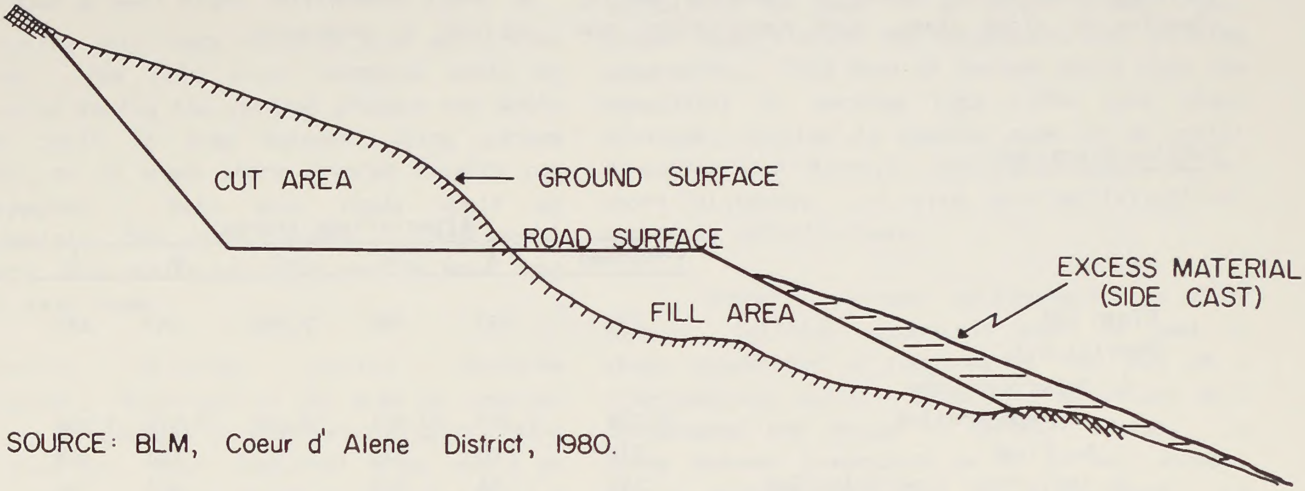
The average road is constructed using a D-7 bulldozer or its equivalent equipped with a U-shaped blade and ripping teeth. Construction normally begins with clearing and grubbing of the road location. Next, excavation is done to create the initial grade and the desired shape of the road. During excavation, some of the material removed would be used as fill (see Figure 2-2).

Roads on slopes of 60 percent or greater would be full benched (see Figure 2-3). Excess material would be placed in stable areas. If adverse impacts are anticipated, end-hauling or drifting would be done. The road bed and fill would be compacted. Fills would be compacted in 12-inch layers. Roads would be designed to drain naturally. Where natural drainage would not protect the running surface or excavation and embankment areas, roadside ditches would be constructed.

Culverts would be placed in draws, live streams, or where surface runoff is channelled. Surface culverts (cross-drains) would be placed using a backhoe. In deep fills, culverts would be placed during excavation. Final shaping of the road and running surface is done with a grader.

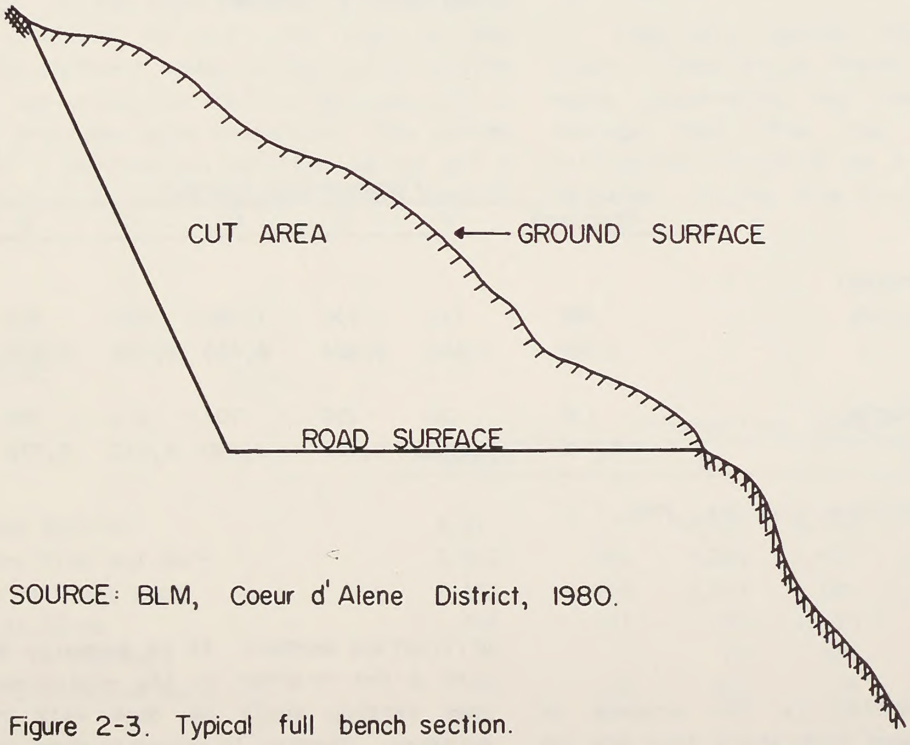
Normally, temporary roads and dead-end main roads would be closed to access. Closures would be accomplished utilizing gates or barriers constructed from earth and debris (refer to Figure 2-1). Roads which are closed would be ripped to a depth of 6 to 10 inches. Prior to ripping, most culverts would be removed, except those located in deep fills or critical water sources.

Disturbed areas, including closed roads, would be stabilized by seeding, fertilizing, and mulching. Seed and mulch would be applied by hand or hydro-mulcher. Seeding would occur as soon as possible after the road is constructed. Reseeding would be done periodically as required during the contract period.



SOURCE: BLM, Coeur d' Alene District, 1980.

Figure 2-2. Typical road cross section.



SOURCE: BLM, Coeur d' Alene District, 1980.

Figure 2-3. Typical full bench section.

Roads would be maintained periodically. Road maintenance consists of regrading the road surface, cleaning of culverts, removing debris, cleaning of ditch lines, spot resurfacing, and other opperations necessary to keep the road in serviceable condition. Roads located near homes or small communities would have a dust palitive applied, if necessary.

Cutting Practices

	Alternatives (Acres)					
	Proposed	A	B	C	D	E
Clear Cut	593	137	700	2,086	652	450
Partial Cut:						
1. Selective Cut-						
a. Regeneration	9,154	2,105	10,801	8,606	10,069	7,338
b. Final	276	63	326		304	166
2. Individual Tree Selection	243	56	287		267	146
3. Mortality Salvage	40	9	47		44	24
4. Commercial Thin	5,608	1,290	6,617		6,169	3,540

SOURCE: BLM, Coeur d'Alene District, 1980.

Timber would be designated to be cut prior to sale and would be felled and bucked into log or tree lengths prior to yarding. Felling of timber in regeneration cuts, single tree selection, or commercial thinnings would be done so that the residual stand would be protected as much as possible. Directional falling would be done on some areas when necessary, e.g., stream buffers. Falling and bucking is normally accomplished with a chainsaw and wedges.

Yarding Methods

	Alternatives (Acres)					
	Proposed	A	B	C	D	E
Ground based Yarding:						
a. Clear cut acres	483	111	570	1,380	531	364
b. Other	7,309	1,681	8,624	6,453	8,039	5,445
Cable Yarding:						
a. Clear Cut Acres	110	26	130	706	121	86
b. Other	8,012	1,843	9,455	2,150	8,813	3,770

SOURCE: BLM, Coeur d'Alene District, 1980.

Ground-Based Yarding

Ground-based yarding is the process of moving logs over ground from where they are cut to a landing prior to transportation to a utilization center. It is normally accomplished with a D-4 tractor or its equivalent, although some yarding would be done with rubber-tired skidders. Yarding is normally done in a downhill direction; however, limited amounts of uphill yarding in the EIS area can be expected. Yarding distances normally would not exceed 1,500 feet.

Existing skid roads would be used as much as possible. New skid roads normally would be constructed during the yarding process and would not be built in draw bottoms, along stream channels, or in areas where adverse impacts can be expected. Main skid roads would be approximately 500 feet apart. Additional secondary skid trails would be used to move logs to main skid roads.

Tractor skidding usually disturbs approximately 30 percent of the area on clearcut units and 20 percent on shelterwood units. Main skid roads and other disturbed areas would be water-barred and seeded prior to the first winter after logging. Tractor skidding would be limited to periods when ground is frozen, snow cover is 2 feet in depth or greater or soil moisture is low enough during the spring, summer, and fall months to minimize compaction.

Cable Yarding

Cable yarding is a method of moving logs from where they are cut to a stationary yarder on the landing. As the name implies, a steel cable would be utilized to pull the logs to the landing. In northern Idaho, normal cable yarding operations use a machine that is equipped with a boom which provides cable elevation. The system consists of a skyline and mainline cables and a carriage that locks to the skyline during lateral yarding. Chokers attached to a dropline secure the individual logs (see Figure 2-4). This system can be used in different modes, i.e., ground lead, one-end log suspension, and full-log suspension. This type of yarder would have the capability of yarding logs 1,000 feet slope distance. Yarding is usually done in an uphill direction, but downhill yarding is possible for short distances. A live skyline (slackline) system is normally used.

Normally, one-end log suspension is used; however, full-log suspension would be used on steep slopes and as required by the TPCC on a site-specific basis. Suspension minimizes soil disturbance and damage to residual stands. By using one-end suspension on 45 percent slopes, ground disturbance would be approximately 12 percent in clearcut units and 18 percent in shelterwood units. Ninety percent of the disturbance would be confined to the skyline corridors. The corridor is a 15-foot wide clearcut in which the carriage and logs travel (see Figure 2-4). Corridors would be spaced at 150 foot intervals. Logs would be laterally yarded no more than 75 feet into the corridors.

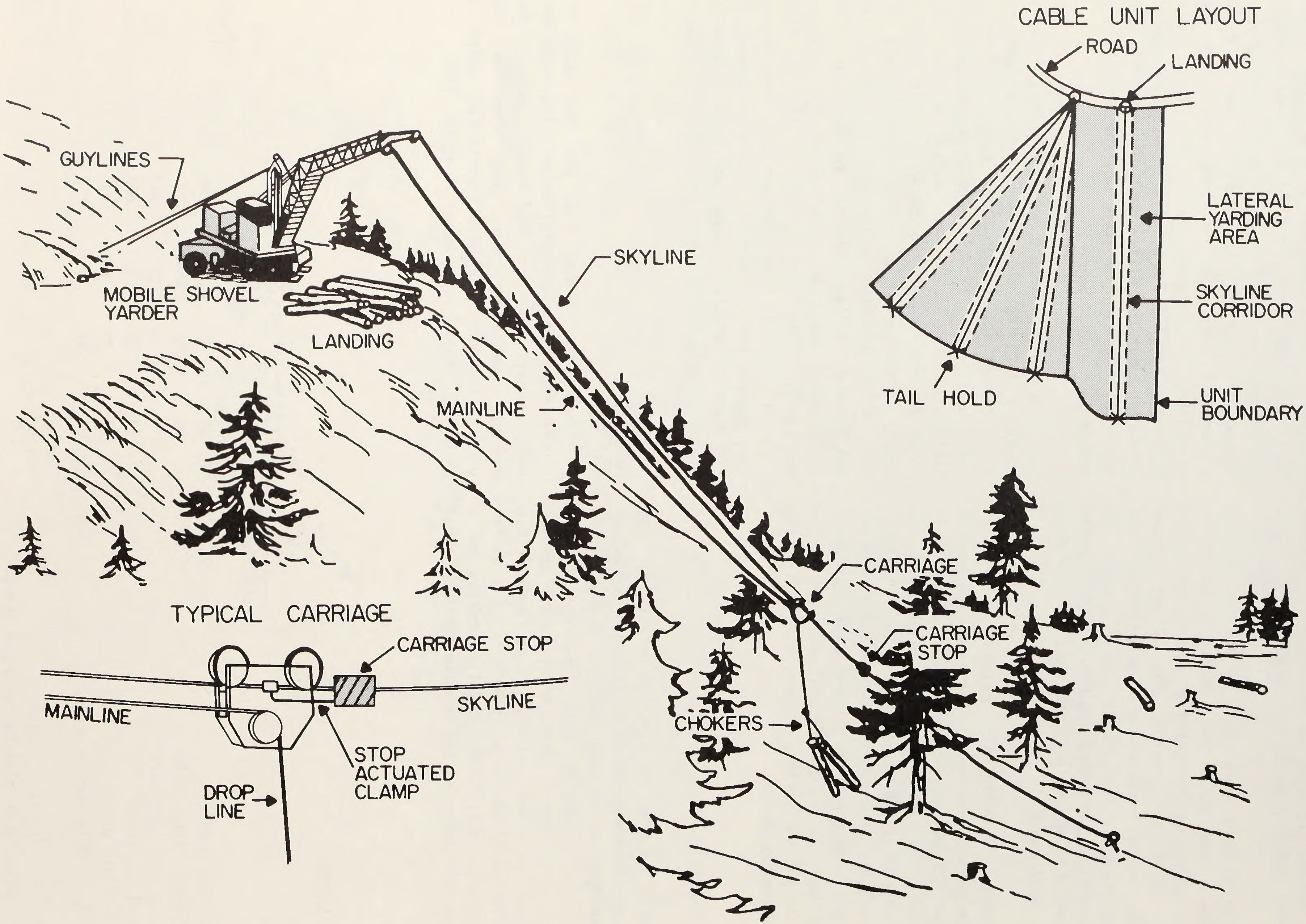
Hauling

Logs are removed from the sale area by truck. These trucks travel on existing roads and roads constructed for the timber sale. The average haul from the sale area to the utilization center or to a distribution point is 35 miles, ranging from about 10 to 65 miles.

Slash Disposal

	Alternatives (Acres)					
	Proposed	A	B	C	D	E
Lop and Scatter	9,271	2,132	10,940	6,460	10,198	7,374
Tractor Pile and Burn	3,633	836	4,286	2,650	3,997	2,384
Cable Pile and Burn	2,131	490	2,515	205	2,344	1,284
Burn in Place	593	137	700	1,800	652	450
Hand Pile and Burn	30	7	35	130	33	18
Grapple Pile and Burn	775	178	914	0	852	467

SOURCE: BLM, Coeur d'Alene District, 1980.



SOURCE: BLM, Coeur d'Alene District, 1980.

Figure 2-4. Typical one-end suspension yarding system.

Slash disposal is a normal function of timber sale contracts. Written instructions (slash plans) are prepared jointly by the BLM and the Idaho Department of Lands under a Memorandum of Understanding. This memorandum requires the purchaser to perform certain items of slash disposal but allows the purchaser the option of paying a specified amount in lieu of performance on optional disposal items. If the option to pay is selected, the Idaho Department of Lands then performs these specified slash disposal items. Slash disposal normally consists of a combination of practices, i.e., slash piling; lopping and scattering; and burning.

Piling

Ground-based. Slash piling would normally be done by a D-4 or comparable size tractor with a brush blade in ground-based yarding units. Piling of logging residue would be done within the unit. Piles would be placed in designated areas such as skid roads, stand openings, and landings. Slash piles would be built so that fuels are concentrated and a minimum amount of soil is present in piles. Piles would be covered so they could be burned after the rains in the fall.

Cable. Slash piling on cable yarding units would be done concurrently with yarding. Piling would occur when slash concentrations are heavy, such as when existing stands contain 50 percent cull material or greater. Slash would be yarded to and piled on landings, roadsides, or specified areas. Material would then be disposed of in the following priority: 1) resold, 2) utilized as firewood, or 3) burned.

Hand. Hand piling of slash would be done in specific areas such as stream buffer zones, fragile site areas, and springs. This work is usually done with a chainsaw and a small power winch.

Grapple. Right-of-way and logging slash within 50 feet of either side of the road would be piled by a loader or long-boom crane using a grapple. These piles would then be covered and burned in the fall.

Lopping and Scattering

Lopping and scattering of slash is usually done in precommercial and commercial thinning, employing hand labor and the use of chainsaws. Slash concentrations are normally light and material can easily be handled. Slash is cut and placed by hand so that material lies within 1.5 feet of the ground and would normally be left to decompose by natural means.

In-place Burning

In-place burning would normally be done on clearcut units and is the process of burning slash where it lies. This material is usually not concentrated in large amounts, which facilitates a light burn. Units to be burned would have a fire trail constructed to mineral soil around the perimeter prior to burning. In-place burning can also be a function of site preparation.

Site Preparation

	Alternatives (Acres)					
	Proposed	A	B	C	D	E
Burn	1,315	303	1,552	40	1,447	879
Scarify	349	80	412	10	384	283

SOURCE: BLM, Coeur d'Alene District, 1980.

Site preparation is normally a combination of several operations. These operations may consist of slash piling, in place burning, and scarification. Slash piling and in-place burning were described in the preceding Slash Disposal section. Scarification would normally be accomplished with a D-4 bulldozer equipped with a brush blade. Scarification operations clear the competing vegetation from the area and place it in windrows or piles. During the process, the soil would be tilled to a depth of 6 to 10 inches. Scarification would be limited to periods when soil moisture is low enough to minimize compaction. The windrows or piles would then be burned in the fall.

Planting

	Alternatives (Acres)					
	Proposed	A	B	C	D	E
Hand Planting	2,275	523	2,684	984	2,502	1,531

SOURCE: BLM, Coeur d'Alene District, 1980.

Tree planting is normally done by contract, and the trees are supplied by the BLM. Planting is done by hand using hoes or planting bars. Contracts are administered by the BLM and payments are based on the quality and quantity of work accomplished. Trees are normally planted 625 to the acre with an 8-foot by 8-foot spacing.

Replanting of some areas can be expected to occur. Approximately 20 percent of the clearcut areas and 50 percent of the partial cut areas would be replanted within the proposal period. Inter-planting would be done in the same manner as the initial planting. Enough trees would be planted to bring the area up to BLM stocking standards.

Precommercial Thinning

	Alternatives (Acres)					
	Proposed	A	B	C	D	E
Sanitation Thin	1,538	354	1,815	0	1,692	1,538
Precommercial Thin	1,516	349	1,789	556	1,668	1,073

SOURCE: BLM, Coeur d'Alene District, 1980.

Precommercial thinning would normally be done by contract. Contracts would be administered by BLM personnel and payments would be based on the quality and amount of work accomplished. All trees to be left would be marked by the BLM. All other vegetation would be cut, normally using a chainsaw, by the contractor. The resulting slash would be treated to comply with the Idaho Forest Practices Act (IFPA). Lopping and scattering would be the common treatments.

Fertilization

	Alternatives (Acres)					
	Proposed	A	B	C	D	E
Aerial Application	2,488	573	2,936	0	2,737	2,045

SOURCE: BLM, Coeur d'Alene District, 1980.

Fertilization would be done under contract and is normally applied by either helicopter or fixed wing aircraft. Unit boundaries would be established and marked to provide a 200-foot buffer along live streams and water sources. The application of fertilizer would be done when weather conditions insure proper distribution; this would limit the amount of overspray. Pelletized urea fertilizer would be applied at the rate to yield 150 pounds to 300 pounds per acre of nitrogen. The need for application of trace elements would be determined by soil test prior to treatment.

COSTS TO IMPLEMENT THE ALTERNATIVES

Table 2-8 summarizes the estimated costs (1979 dollars) for the BLM to implement each of the alternatives. It is assumed that full funding would be provided to implement the selected alternative. If full funding is not provided, the program would be proportionately reduced. Timber harvest levels would not be maintained at the expense of forest development activities necessary to support the timber harvest.

Table 2-9 summarizes the expected stumpage revenues that would be generated by the alternatives. Stumpage revenues are the product selling values (e.g., lumber, plywood, etc.) minus logging and manufacturing costs.

MONITORING

Most BLM actions are authorized and land management practices monitored through administration of the contracts. When active, timber sale contract areas are visited at least once a week and more often if sensitive operations are in progress. Daily administration visits are not uncommon when harvest is moving at a fast pace, slash disposal is occurring, and road construction involving critical aspects such as stream crossing structures is taking place. Daily visits also occur when there is reason to believe that the operator will require help in the interpretation of contract requirements.

Contracts for tree planting and precommercial thinning are monitored at regular intervals to determine the quality and quantity of work accomplished. Visits to these operations range from twice a week to the full-time presence of a Bureau contract administrator depending on the experience of the contractor and rate of progress.

The monitoring of environmental impacts on specific resources will be accomplished primarily through site-specific environmental assessment monitoring and follow-up. The district MFP identified specific monitoring and future study needs which will be implemented during the next decade. Systems designed to monitor certain critical environmental components will be installed during the early stages of the proposed management program. These include base line and project stations to monitor water quality in rivers and streams. Resource quality surveys will be periodically made to document trends in stream side bank stability, aquatic habitat, terrestrial wildlife habitat, and forest stocking rates.

INTERRELATIONSHIPS

BLM PLANNING

The alternatives including the proposed action are an outgrowth of BLM's land use planning process which, among other things, seeks

TABLE 2-8

COSTS FOR 10-YEAR PERIOD TO IMPLEMENT AN ALTERNATIVE
IN THOUSANDS OF 1979 DOLLARS ($1,000)

TIMBER SALES: [1]	Proposed Action	Alt. A Non-Commodity	Alt. B Commodity	Alt. C No-Action	Alt. D Accel. Harvest	Alt. E State Lieu
Planning & Administration	2,389	549	2,824	1,918	2,628	1,882
Easement/Acquisition	773	180	915	398	848	592
Road Construction [1,3]	3,065	852	4,360	4,144	4,050	2,790
Logging Costs [2,3]	17,898	4,115	21,159	13,060	21,576	13,540
Monitoring [1]	239	55	282	192	263	188
FOREST DEVELOPMENT: [4]						
Site Preparation-						
In Place Burning	108	25	127	3	119	72
Scarification	105	24	124	3	116	85
Planting	362	83	427	156	398	243
Precommercial Thinning	147	34	174	54	162	104
Fertilization	396	91	467	0	435	325
TOTAL	25,489	6,008	30,887	19,878	30,595	19,821

SOURCES:
[1] BLM, Coeur d'Alene District, 1980.
[2] USFS, Region 1, 1980.
[3] Costs are subtracted from value of timber.
[4] BLM, Coeur d'Alene District, 1980. Includes BLM overhead and monitoring costs.

TABLE 2-9

EXPECTED STUMPAGE REVENUES FOR 10-YEAR PERIOD
IN THOUSANDS OF 1979 DOLLARS ($1,000)

	Proposed Action	Alt. A Non-Commodity	Alt. B Commodity	Alt. C No-Action	Alt. D Accel. Harvest	Alt. E State Lieu
Stumpage Dollars	140,500	32,300	166,100	223,800	154,600	110,700

SOURCE: BLM, Coeur d'Alene District, 1980

to fulfill BLM's obligations to manage public lands to serve a variety of purposes. Federal policy directs that the following resource values receive consideration: watershed, wildlife, recreation (including scenic), wilderness, range, and forest.

The planning process begins with an inventory of basic resources known as Unit Resource Analysis (URA) and progresses through the management decisions developed in the Management Framework Plan (MFP). Basic resource data for the area is contained in the Emerald Empire URA, 1979, and the Chief Joseph URA, 1979. As mentioned in the Land Use Allocation portion of this chapter, proposed decisions are documented in MFP Step 2. These documents (Emerald Empire MFP, 1980 and Chief Joseph MFP, 1980) and all other planning documents may be reviewed in their entirety at the BLM Coeur d'Alene District Office. For details on BLM's multiple use planning system and how it relates to timber management planning, see the Final Environmental Impact Statement on Timber Management, BLM, USDI, 1975.

WITH FEDERAL ORGANIZATIONS

Army Corps of Engineers

A continuing relationship of coordination is maintained with the Army Corps of Engineers especially in the Dworshak reservoir area. In addition, the Regulatory Program for the Corps of Engineers as it pertains to minor road crossing fills will be followed (Federal Register, Vol. 42, No. 138, July 19, 1977, Sec. 323.4-3).

U. S. Fish and Wildlife Service

Cooperative wildlife study projects and threatened/endangered species consultations are coordinated through the U. S. Fish and Wildlife Service.

U. S. Forest Service

The U. S. Forest Service administers approximately 57 percent of the land within the EIS area. Since most of this land borders BLM administered lands, mutual cooperation benefits both agencies. The Forest Service provides fire protection for BLM lands in the Lund Creek-Little North Fork Clearwater River areas, Slate Creek-Hoyt Flat area, Silver Belt areas, and Clark Fork area.

Planning goals and objectives are coordinated between the agencies since both have the same basic management goals for the administration of public lands.

National Park Service

The National Park Service is responsible for the coordination of management of the lower Salmon and Snake rivers which are components of the National Wild and Scenic Rivers System.

WITH STATE ORGANIZATIONS

Idaho Department of Fish and Game

The wildlife program and vegetative manipulation projects are coordinated with the Idaho Department of Fish and Game.

Department of Water Resources

The Department of Water Resources sets minimum standards for protecting waterways where culvert, bridge, or channel relocation is contemplated. Coordination of these activities is maintained.

Idaho Department of Lands

The Idaho Department of Lands is involved with BLM for land use planning on adjacent state lands. The State Lieu Selection process is handled by this agency, which may significantly affect the BLM timber management program. The BLM adheres to the provisions of the Idaho Forest Practices Act which was developed by the Department of Lands.

Idaho Department of Health and Welfare

The BLM entered into a cooperative agreement in September 1979 with the Idaho Department of Health and Welfare with a common objective of protecting water and air resources within the state. The agreement provides for information exchange and agency coordination in solving state water and air quality problems.

Idaho State Historic Preservation Officer (SHPO)

The BLM consults with SHPO to determine the significance of cultural/historical sites and the eligibility of any site for inclusion on the National Register of Historic Places.

State Fire Protection Districts

State Fire Protection Districts provide fire protection for much of the BLM administered land. Slash work on some timber sale areas is also completed by the Fire Protection Districts.

REQUIREMENTS FOR FURTHER ENVIRONMENTAL ASSESSMENTS

Geographic site-specific environmental assessments (EA) will be prepared for all timber sales and forest development projects. These assessments will be tied to this EIS to ensure that all pertinent actions and probable environmental impacts are assessed. Should an EA disclose significant adverse impacts which cannot be readily mitigated or which involve sensitive issues, a recommendation to prepare a full environmental impact statement on the project may be appropriate.

CHAPTER 3

AFFECTED ENVIRONMENT

CHAPTER 3
AFFECTED ENVIRONMENT

INTRODUCTION

The Environmental Impact Statement (EIS) area is basically the northern panhandle of Idaho, extending from the Canadian border on the north to the Payette National Forest on the south. This area, which is about 220 miles long by 70 miles wide, contains a topographic profile ranging from river canyon areas with elevations less than 1,000 feet to mountain peaks with elevations exceeding 8,400 feet. The region includes some of the most varied geology in Idaho. North of Coeur d'Alene, the area is dominated by the granite rocks of the Kaniksu Batholith to the west and the Precambrian Belt series sedimentary rocks to the east. Much of this northern area has been heavily affected by glaciation. South to Lewiston, the geology consists primarily of Precambrian Belt series with some Columbia River Basalt along the western part of the state. Further south, the Columbia River Basalt flows have covered most of the area. Within the EIS area is the Coeur d'Alene Mining District. This region, between Kellogg and Mullan, has produced well over $2 billion worth of lead, zinc, silver, and other valuable metals. Topography, geology, and mining activities will not be affected by the alternatives.

The majority of land in the EIS area, 77.3 percent, is in forest use; 11.3 percent is in rangeland use; 9.5 percent is in agricultural use; and the remaining 1.9 percent is in urban use. Despite the large Federal ownership of land in the area (61 percent), the Bureau of Land Management (BLM) manages only 1.9 percent of the total land area. These BLM administered lands are widely scattered throughout the area. Because of this intermingling with private, state, and Forest Service lands and due to the absence of large blocks of land under BLM management, it is unlikely that any particular social system or lifestyle is primarily dependent on BLM land for survival. Even though multiple use decisions may have discomforting effects on a few individuals, the effects on the social systems of the area would be minimal no matter which management option is chosen. There will, therefore, be no further discussion of social values.

Likewise, prime and unique agricultural lands, proposed Areas of Critical Environmental Concern (ACEC), and designated roadless areas will not be affected by the alternatives and, therefore, will not be discussed further.

CLIMATE

The climate of the Coeur d'Alene District is associated with the southerly and easterly drift of weather systems that develop in the northern and central Pacific Ocean. In the winter, storms pass over the region causing a distinctly wet climate. During summer, however, storms pass farther north causing a relatively dry climate. In general, the eastward movement of the marine air keeps temperatures moderate except when continental high pressures reverse the general flow to a westerly direction. This brings periods of hot dry air in the summer and cold weather in the winter. Table 3-1 presents climatic data for several representative weather stations in the district and exemplifies the varying conditions found within the district.

Topographic features create localized microclimates throughout the district. The widely ranging elevations; the rapidly changing orientation of the mountains and rivers; and the intervening topographic barriers all add to the climatic variations. The Clearwater River basin, for example, is so oriented that moist Pacific air enters the lower basin and is subjected to vertical lifting. As the air moves over the mountains, considerable precipitation is produced. Another example is the highly variable surface winds caused by the differing topography. Many valleys in the district have average wind speeds less than 10 miles per hour while the more sheltered valleys of the Kootenai, Clark Fork, and Salmon have average wind speeds as low as 5 to 6 miles per hour (PNRBC 1970).

AIR QUALITY

In general, the air quality within the district meets the ambient air quality standards. Northern Idaho is part of two Federal Air Quality Control Regions (AQCR), Regions 62 and 63.

TABLE 3-1

TEMPERATURES AND PRECIPITATION FOR SELECTED STATIONS
IN THE COEUR D'ALENE DISTRICT

Weather Station	Elevation Feet	Temperature (°F)					Precipitation (Inches)	
		Average Annual	Average January	Average January Minimum	Average July	Average July Maximum	Average Annual	Average Snowfall
Porthill	1,800	45.4	24.8	17.3	66.5	83.4	21.3	64.7
Sandpoint	2,100	45.3	26.5	21.0	64.8	81.2	33.6	87.8
Kellogg	2,290	47.1	28.2	21.3	67.7	85.4	30.2	59.3
St. Maries	2,220	47.5	28.6	21.9	67.5	86.4	30.5	59.5
Lewiston	1,413	51.7	31.2	24.4	73.4	89.2	13.2	18.5
Kooskia	1,260	50.5	30.7	23.4	71.6	91.9	24.9	25.4
Elk City	4,058	41.2	22.5	11.8	64.9	79.4	30.1	148.0
Riggins	1,800	54.3	34.0	25.9	76.2	93.2	16.7	7.9

SOURCE: NOAA publications and BLM analyses.

Within these regions, there are two nonattainment areas, the Silver Valley and Lewiston areas (see Maps 3-1 and 3-2). A nonattainment area is a designated area that does not meet ambient air quality standards. Bureau lands are located in and around the Silver Valley nonattainment area and require some management constraints. In the Lewiston area, however, there are no district lands that would affect the nonattainment area. Both of these nonattainment areas are located in deep valleys and have major air pollution point sources in the valley bottom. Also shown in Maps 3-1 and 3-2 are existing wilderness areas which are designated Class I Federal areas requiring high visibility standards.

The Silver Valley has nonattainment problems for total suspended particulates, sulfur dioxide, and lead. Although still a problem, the sulfer dioxide levels have sharply declined since two tall smelter stacks were put into operation in 1977. The Lewiston area has high total suspended particulate levels. This is due to the area's deep canyon location which cuts off prevailing winds causing frequent and prolonged periods of reduced atmospheric dispersion (IDHW 1980).

In the Idaho State Implementation Plan for air quality (IDHW 1980), the statewide emissions inventory identifies the principal air pollution emission sources and estimates their contributions. Primary impacts of our forest management activities would be included in the inventory's "miscellaneous area sources" group under the categories of prescribed burning and unpaved roads. Only particulate emissions are estimated under these categories. Statewide, miscellaneous area sources account for 99.5 percent of the particulates with unpaved roads the major source (60.2 %) followed by wildfire (20.0%), agriculture (17.7%), and prescribed fires including slash burning (1.7%) (IDHW 1980).

SOILS

Soil inventory documents of the Coeur d'Alene District describe in detail soil mapping units at the soils series level (on file at the District Office). Table A of Appendix 3-1, Properties and Interpretations of Coeur d'Alene District Soils, describes each soil series mapped in the district. Table B of Appendix 3-1 identifies the major soil associations and acreage of each.

A general soils map was developed by combining soil associations having similar properties and geology for the purpose of this document (see Maps 3-3 and 3-4). Table 3-2 shows the major mapping units, soil series, natural erosion rates, and acreages of these series groups.

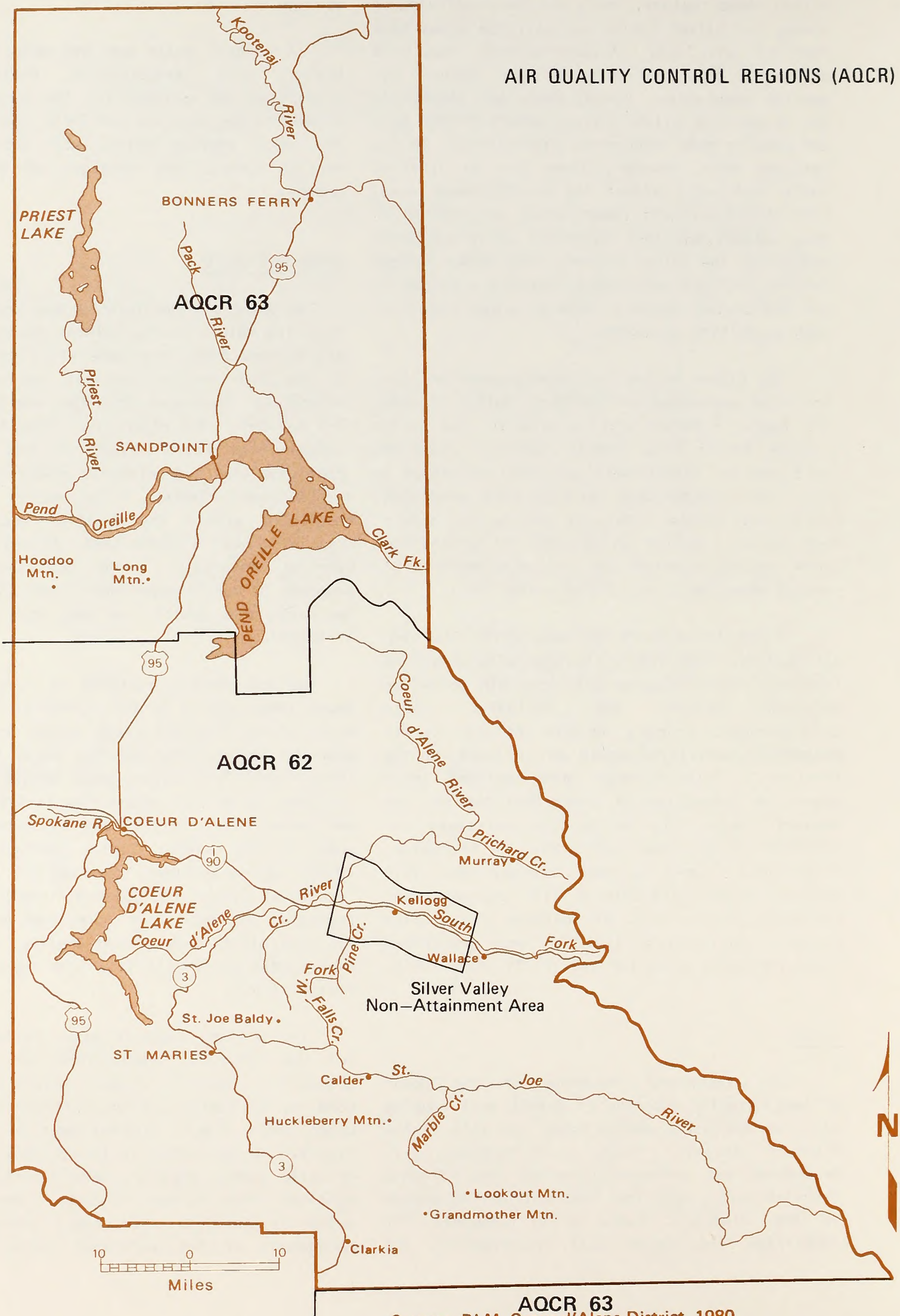
WATER RESOURCES

The Coeur d'Alene District has scattered lands that lie mainly in the Salmom, Clearwater, Snake and Spokane river drainages with limited amounts in the Pend Oreille, Kootenai, and Palouse river drainages. The major drainages are shown on Maps 3-5 and 3-6. The rivers vary from the virtually uncontrolled Salmon River to the extensively controlld (for hydroelectric power) Pend Oreille and Spokane rivers. The major lakes and reservoirs within the district are Lake Pend Oreille, Coeur d'Alene Lake, Priest Lake, and Dworshak Reservoir. The BLM lands contain segments of many streams and rivers but in only a few cases does public land make up a majority of a stream's length.

The topographic features of northern Idaho cause water yields to very greatly. The annual water yield from BLM lands ranges from zero to over 40 inches, the average being 13.5 inches (Rosa 1968). This equals about 305,000 acre feet per year, or an equivalent flow of 422 cubic feet per second (cfs). Streamflows and water yields at some of key United States Geological Survey (USGS) gaging stations (see Maps 3-5 and 3-6 for locations) within the Coeur d'Alene District are presented in Table 3-3. Compared to the flows (in cfs) of the Snake, Pend Oreille, or Kootenai rivers, the equivalent flow from the BLM land is insignificant.

The primary uses of water in the district are for domestic consumption and industrial processes. However, a small amount of water is used for irrigation on the Rathdrum Prairie and other small tracts located next to streams or rivers. Ground water is the primary source for domestic water; however, some domestic water is obtained from surface sources. When domestic water is obtained from small streams, close management of the watershed above the water

COEUR D'ALENE DISTRICT MAP
NORTH HALF

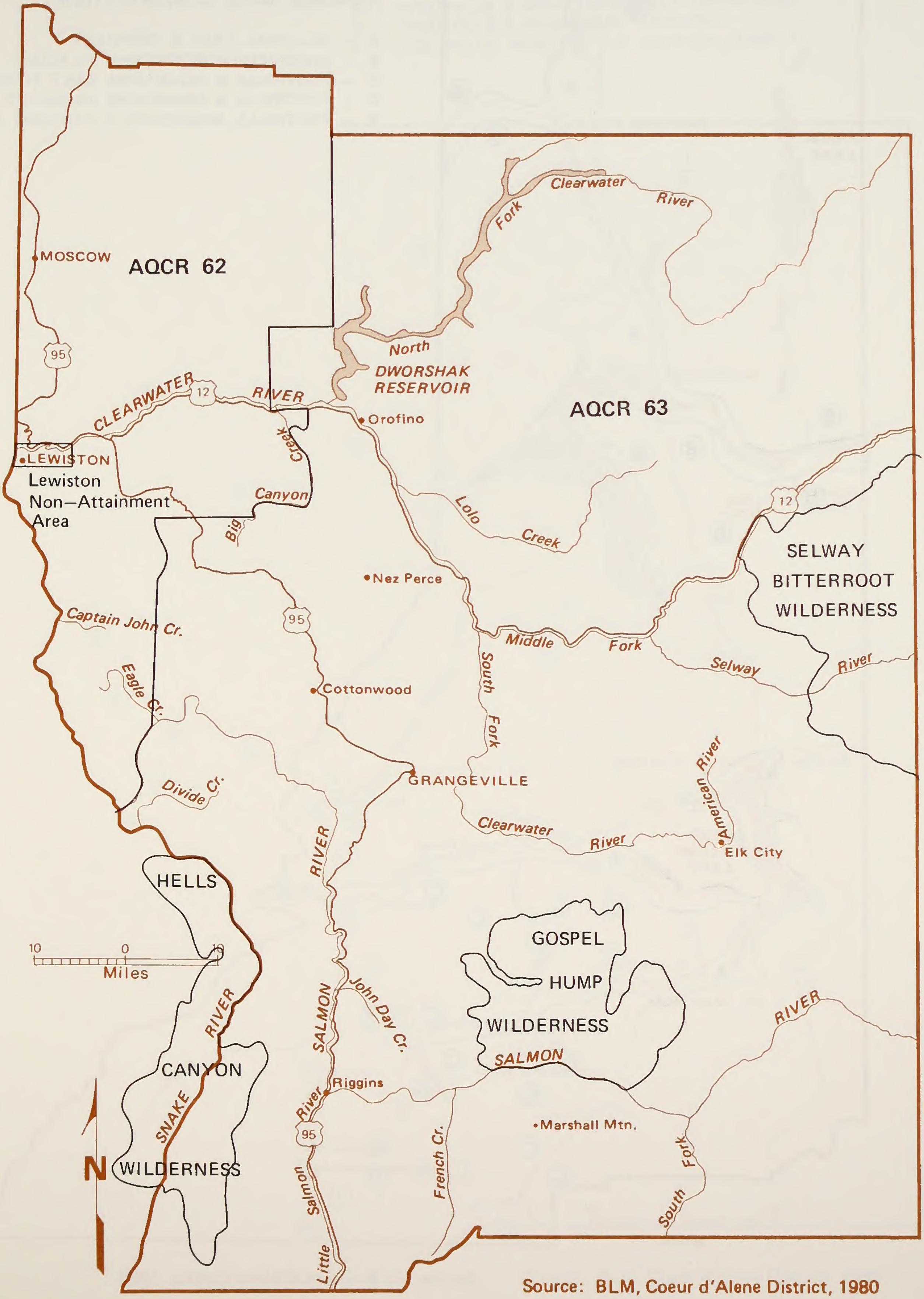


Source: BLM, Coeur d'Alene District, 1980.

MAP 3–1

COEUR D'ALENE DISTRICT MAP
SOUTH HALF

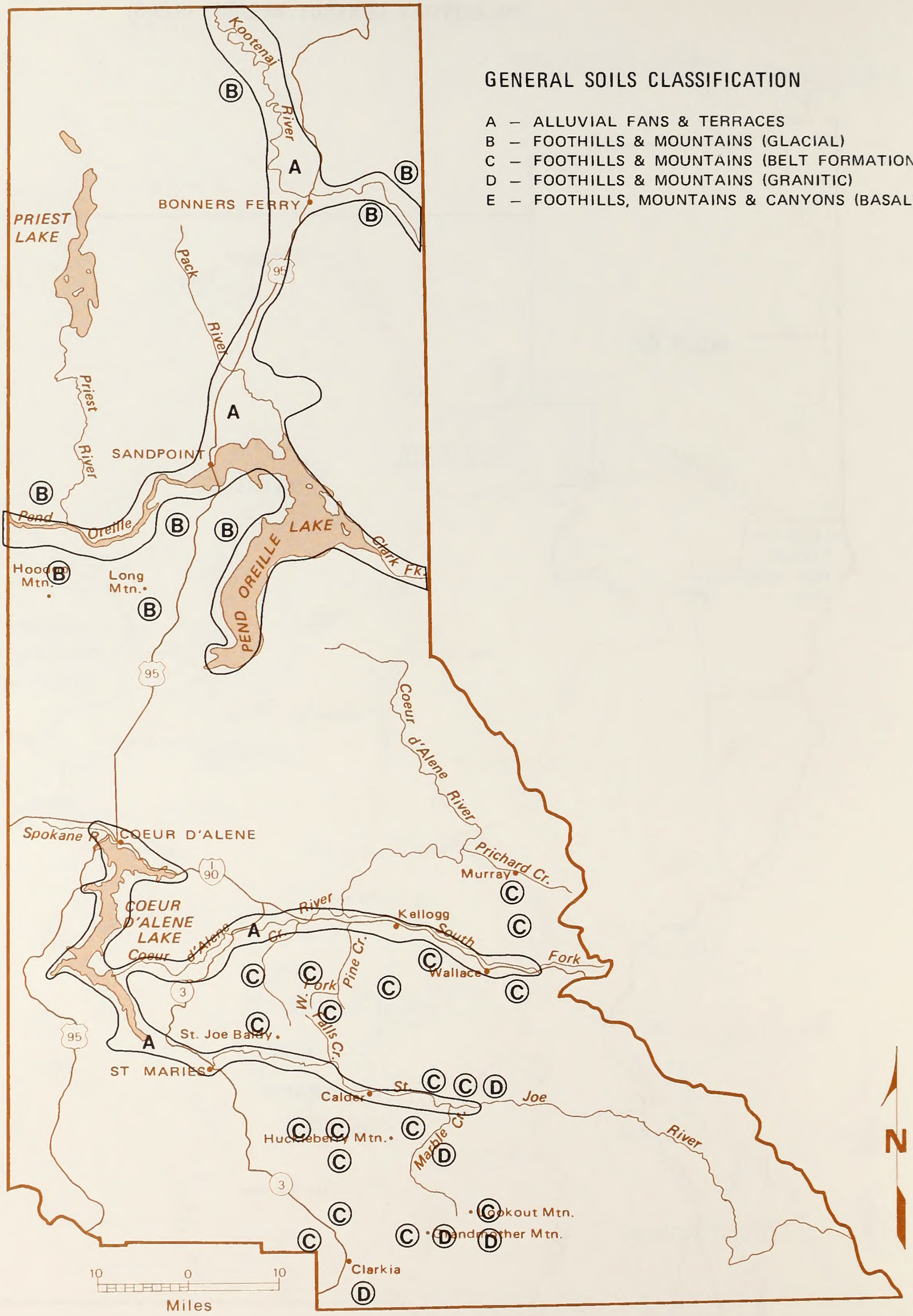
AIR QUALITY CONTROL REGIONS (AQCR)



Source: BLM, Coeur d'Alene District, 1980

MAP 3–2

COEUR D'ALENE DISTRICT MAP
NORTH HALF



GENERAL SOILS CLASSIFICATION

A – ALLUVIAL FANS & TERRACES
B – FOOTHILLS & MOUNTAINS (GLACIAL)
C – FOOTHILLS & MOUNTAINS (BELT FORMATION)
D – FOOTHILLS & MOUNTAINS (GRANITIC)
E – FOOTHILLS, MOUNTAINS & CANYONS (BASALT)

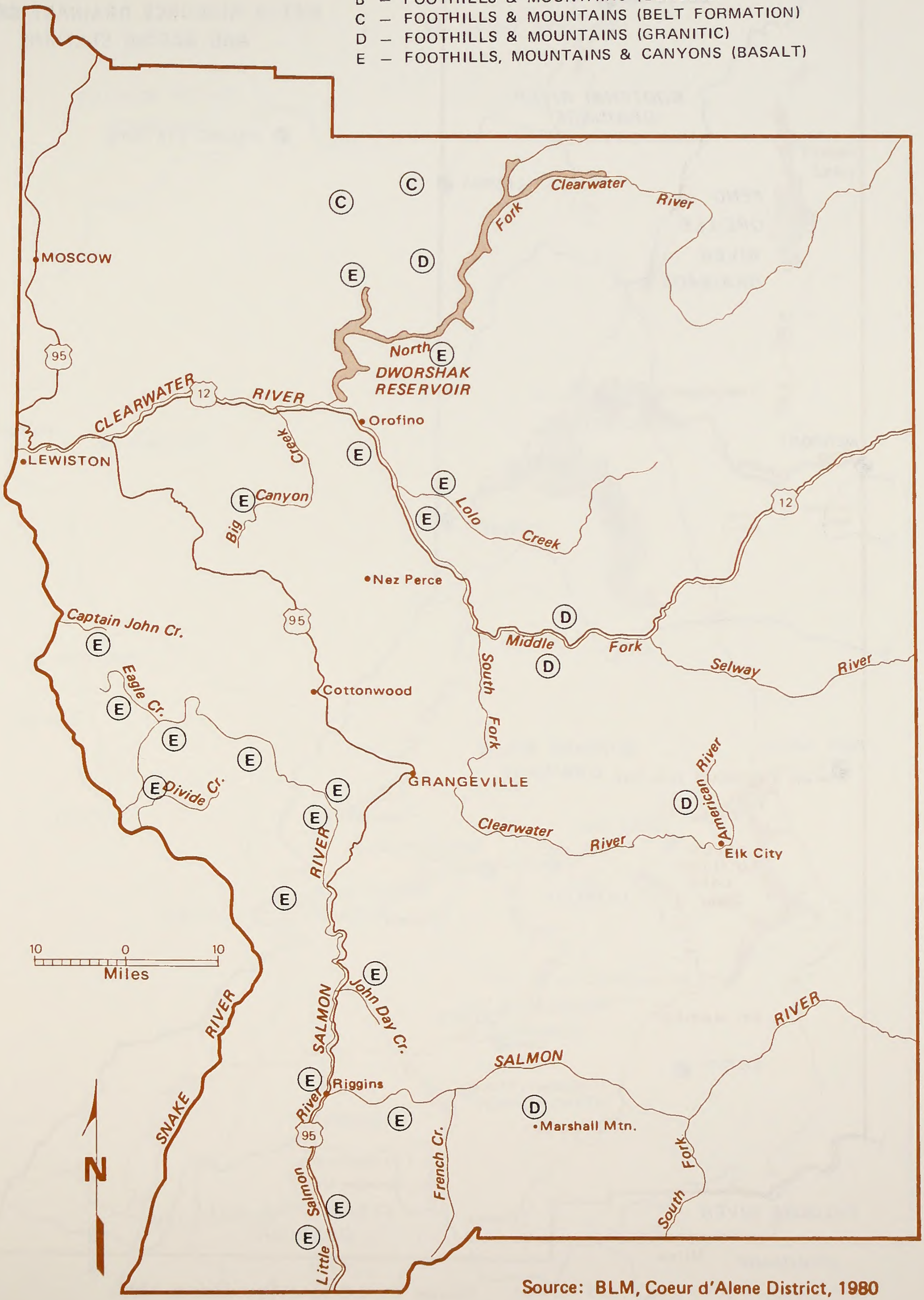
Source: BLM, Coeur d'Alene District, 1980.

MAP 3–3

COEUR D'ALENE DISTRICT MAP
SOUTH HALF

GENERAL SOILS CLASSIFICATION

A – ALLUVIAL FANS & TERRACES
B – FOOTHILLS & MOUNTAINS (GLACIAL)
C – FOOTHILLS & MOUNTAINS (BELT FORMATION)
D – FOOTHILLS & MOUNTAINS (GRANITIC)
E – FOOTHILLS, MOUNTAINS & CANYONS (BASALT)

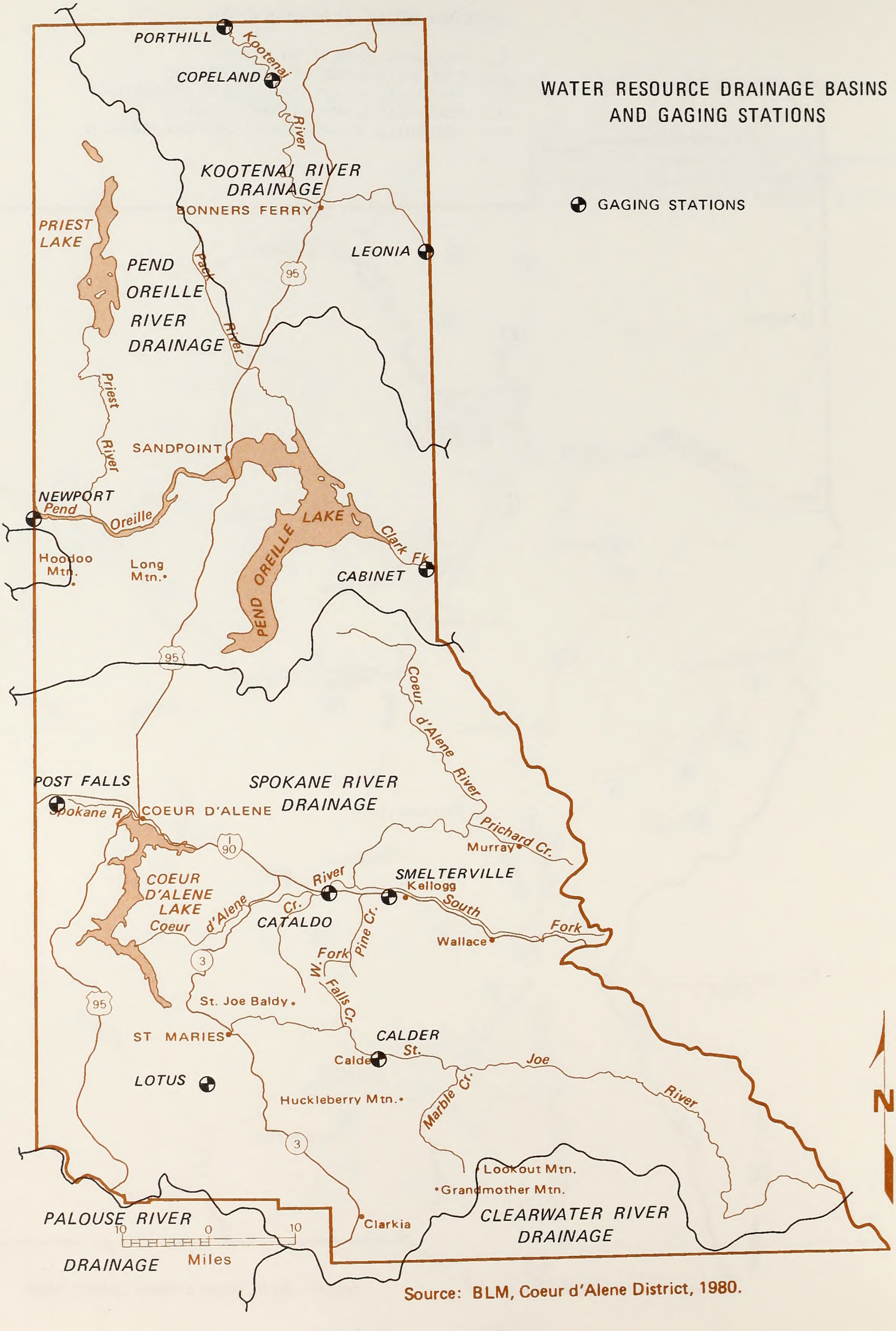


Source: BLM, Coeur d'Alene District, 1980

MAP 3–4

COEUR D'ALENE DISTRICT MAP
NORTH HALF

WATER RESOURCE DRAINAGE BASINS AND GAGING STATIONS

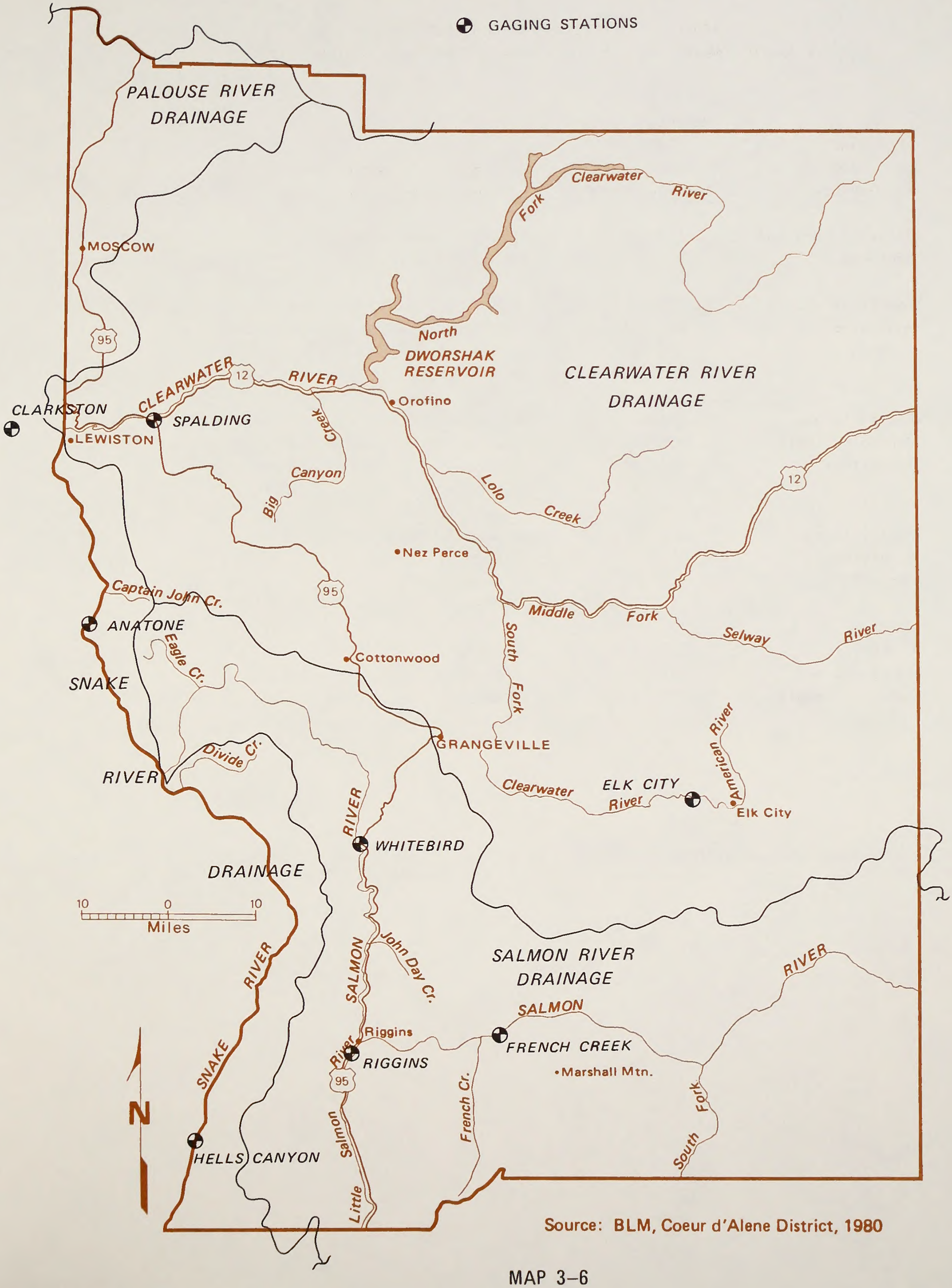


Source: BLM, Coeur d'Alene District, 1980.

MAP 3–5

COEUR D'ALENE DISTRICT MAP
SOUTH HALF

WATER RESOURCE DRAINAGE BASINS AND GAGING STATIONS



Source: BLM, Coeur d'Alene District, 1980

MAP 3–6

TABLE 3-2

ACREAGE, SERIES, AND NATURAL EROSION RATES
OF MAJOR COMBINED SOIL ASSOCIATIONS OF THE COEUR D'ALENE DISTRICT

Symbol	Land and Geology	Natural Erosion Rate By Slope % In Tons/Acre/Year	Major Soil Series and Miscellaneous Land Types	Acres	% of Area
A	Alluvial Fans and Terraces	15%=.010	Elmira, Franhampton, Rubson, Selle, Alluvial Land	2,872	1
B	Foothills and Mountains (Glacial)	30%=.024 45%=.035 60%=.052	Artnoc,Caboose, Crash Idamont, Pend Oreille, Porthill, Stien, Treble, Wishbone, Rockland, Rock outcrop.	18,238	7
C	Foothills and Mountains (Belt formation)	30%=.022 45%=.033 60%=.048	Ardenvoir,Brickel, Divers Dorb, Huckleberry, McCrosket, Molly, Tekoa, Rockland, Rock outcrop, Rubbleland.	115,764	43
D	Foothills and Mountains (Granitic)	30%=.023 45%-.034 60%=.050	Brower, Garveson, Helmer Jughandle, Lochsa, Molly, Nakarna, Nazaton, Spokel, Suttler, Yokus, Rock outcrop.	56,903	21
E	Foothills, Mountains and Canyons (Basalt)	30%=.018 45%=.026 60%=.038	Bluesprin, Brody, Gwin Klickson, Lawyer, Lick-skillet, Riggens, Tannahill, Wapshilla, Rock outcrop.	77,648	28
				271,425	100

SOURCE: BLM, Coeur d'Alene District, 1980.

TABLE 3-3

STREAMFLOW AND WATER YIELD AT SELECTED STATIONS

River	Station	Drainage Area Sq. Mile	Water Yield in/yr	Annual Mean Flow cfs
Kootenai	Leonia	11,740	16.25	14,060
Kootenai	Copeland	13,400	15.95	15,740
Kootenai	Porthill	13,700	16.00	16,140
Clarkfork	Cabinet	22,073	13.81	22,450
Pend Oreille	Newport	24,200	14.63	26,080
St. Maries	Lotus	437	16.09	518
St. Joe	Calder	1,030	31.43	2,384
S.F. Coeur d'Alene	Smelterville	202	30.71	457
Coeur d'Alene	Cataldo	1,220	28.41	2,553
Spokane	Post Falls	3,840	22.43	6,345
S. F. Clearwater	Elk City	261	14.20	273
Clearwater	Spalding	9,570	22.08	15,570
Salmon	French Ck	12,270	11.64	10,520
Little Salmon	Riggins	576	20.17	856
Salmon	Whitebird	13,550	11.31	11,290
Snake	Hells Canyon	73,300	4.16	22,460
Snake	Anatone	92,960	5.41	37,060
Snake	Clarkston	103,200	6.58	50,030

SOURCE: USGS water resources data for Idaho 1975 and earlier reports or water supply papers.

diversion points is required. Table 3-4 lists the major municipal users of surface water within the district. The industrial use of water is primarily related to mining and forest products (IDWR 1976a and 1976b).

The most productive ground water area in northern Idaho is the Rathdrum Prairie. The prairie was formed by glaciers scouring out the area and depositing coarse sediments. This aquifer has been classified by the Environmental Protection Agency (EPA) as a "sole source" for the Spokane Valley under the Safewater Drinking Water Act. There are other minor aquifer systems in the district with varying productivity. Less than 1,000 acres of BLM land are located in aquifer areas or their recharge zones.

Sediment, which is the soil erosion that reaches the stream systems, is a major contributor to the degradation of the water quality of streams in the Pacific Northwest. Sediment yield is highy variable and is strongly influenced by streamflow, geology (including soils and geomorphic characteristics), and land use (EPA 1978). There is only limited long-term sediment yield data available for northern Idaho. Table 3-5 gives sediment data for the three water quality stations in the area that USGS has collected and analyzed information from for any extended period.

Table 3-6 summarizes water quality problems of northern Idaho. Generally, the water quality of the region is very good. However, the South Fork of the Coeur d' Alene River which includes the Coeur d'Alene Mining District is one of the most severly degraded streams in Idaho. This drainage contains many scattered tracts of BLM administered lands (25,024 acres). Water quality degradation from the mining district extends downstream with elevated zinc and copper levels seen below Lake Coeur d'Alene near the Washington-Idaho state border. The Coeur d'Alene River, which joins the South Fork, is of very high quality and dilutes the pollution from the mining district.

The major sources of pollution in the Coeur d'Alene Mining District are active mining operations, drainage from inactive mines and mine tailings, domestic sewage, and nonpoint sources. Nonpoint sources include forest practices, livestock grazing, road construction, individual wastes, and recreation (IDHW 1978). Damage from mining, logging, and extensive fires (during the 1910-1930 period) caused increased flows and erosion. This resulted in extensive watershed damage and siltation in the lower drainage areas (IDWR 1976).

In other areas, water pollution point sources have been identified and are being corrected by EPA permit programs. Other water quality problems are being caused by nonpoint sources. The following stream segments have BLM lands in their drainages and have been identified by the Idaho Department of Health and Welfare (IDHW) as having nonpoint source problems (IDHW 1978): Cocolala Lake; tributaries to the South Fork Coeur d'Alene River; Coeur d'Alene Lake and tributaries; lower St. Joe River; lower St. Maries River; Bear Creek; lower Potlatch River; Lapawi Creek; Cottonwood Creek (Nez Perce County); Big Canyon Creek; Lawyers Creek; Cottonwood Creek (Idaho County); and Three Mile Creek.

VEGETATION

INTRODUCTION

The vegetation in the EIS study area consists of a wide variety of plant communities. Climate, topography, fires, and man's past activities have had a major effect in shaping the present vegetation. The vegetation in the district is divided into the following major types:

Grassland and Other Non-forest	73,998	acres
Forest	197,427	acres
Total District	271,425	

An estimated 27,180 acres of the total forest are incapable of producing at least 20 cubic feet of wood per year and are, therefore, considered non-productive forest.

FOREST COMMUNITIES

The forest vegetation is characterized by vegetative layers, or stratum, resulting from the relative canopy heights of trees and shrubs and

TABLE 3-4

MUNICIPAL USERS OF SURFACE WATER

Municipal User	Source Name
Bonners Ferry	Unnamed Stream
Moravia	Caribou Creek
Colburn	Berry Creek
Sandpoint	Little Sand Creek
Sandpoint	Pend Oreille Lake
Hope-East Hope	Strong Creek
Rathdrum	Spring Branch Creek
Coeur d'Alene	Coeur d'Alene Lake
Pinehurst	Upper Pine Creek
Kellogg High School & West Shoshone Hospital	Jackass Gulch
Central Shoshone (Including Kellogg & Osburn)	Milo Creek
Central Shoshone (Including Kellogg & Osburn)	Slaughterhouse Gulch
Central Shoshone (Including Kellogg & Osburn)	East Fork Elk Creek
Central Shoshone (Including Kellogg & Osburn)	Big Creek
Central Shoshone (Including Kellogg & Osburn)	MCFarren Gulch
Central Shoshone (Including Kellogg & Osburn)	Shields Creek
Wallace	Placer Creek
Wallace	Watson Gulch
Mullan	Boulder Creek
Burke	Sawmill Creek
Murray	Alder Creek
St. Maries	Rochat Creek
Peck	Canyon Creek
Orofino	Clearwater River
Clearwater	Wall Creek
Riverside	Clearwater River
Kamiah	Clearwater River
Elk City	Big Elk/Little Elk Creek

SOURCE: BLM, Coeur d'Alene District Office, 1979

TABLE 3-5

SEDIMENT YIELD OF SNAKE, CLEARWATER, AND KOOTENAI RIVERS

Water Year	Snake R. at Anatone (92,960 sq. mi.) Sediment (tons)	Clearwater R. at Spalding (9,570 sq. mi.) Sediment (tons)	Kootenai R. at Copeland (13,400 sq. mi.) Suspended Sediment (tons)
1966	---	---	1, 368,637[1]
1967	---	---	2,670,748
1968	---	---	1,151,989
1969	---	---	2,602,654
1970	---	---	736,346
1971	---	---	2,452,096
1972	3,000,000	970,000	639,476[2]
1973	251,000	36,300	124,034
1974	5,531,000	1,347,000	933,874
1975	2,250,000	477,500	189,115[1]
1976	2,345,000	446,000	470,789
1977	28,100	34,000	94,055
1978	1,063,000	279,000	115,229
1979	452,000	216,000	143,259

Data for Snake and Clearwater rivers and the 1979 Kootenai River are provisional data not yet published.

[1] Data for part of water year only.

[2] Libby Dam modified flows and sediment loads from March 1972 on.

SOURCE: USGS Resource Data Reports and personal communications with Michael Jones and Walton Low, USGS, Boise, April 1980.

TABLE 3-6

WATER QUALITY PROBLEMS OF NORTHERN IDAHO

IDHW/EPA Trend Station	Identified Water Quality Problems	Major Significant Upstream Sources
Below Hells Canyon Dam	Elevated summer temperatures, depleted dissolved oxygen, and excessive nutrients	Mining
Salmon River at Whitebird	High summer temperatures near mouth and localized problems of sediment and turbidity	Silvicultural and mining
Snake River at Anatone	Adverse summer temperatures, excessive nutrients and at times high copper and mercury concentrations	Possible Oregon and Washington Sources
Clearwater River at Spalding	Occasional problems with iron	Dryland farming
St. Joe River at St. Maries	Elevated summer temperature and excessive phosphorous concentrations	Forest practices and mining
Coeur d'Alene River at Enaville	Low ph related to naturally low buffering capacity	Forest practices and mining
S.F. Coeur d'Alene River at Enaville	Ph violations, bacteria violations, excessive nutrients, excessive turbidity and high levels of zinc, cadmium, lead, mercury, and iron.	Active mining, and related industry, sewer district, inactive mining
Coeur d'Alene River at Rose Lake	Ph violations, a few bacteria violations, and high levels of zinc, cadmium, mercury, and iron	South Fork source, inactive mining and mine tailings
Spokane River at Post Falls (Below Coeur d'Alene Lake)	Elevated summer temperatures, ph violations, and high zinc concentrations	City of Coeur d'Alene and individual waste disposal, shoreline encroachments, forest practices
Clark Fork River at Clark Fork	Elevated summer temperatures	Sources in Montana
Kootenai River near Copeland	High summer temperatures and copper concentrations	Channel erosion

SOURCE: IDHW 1978

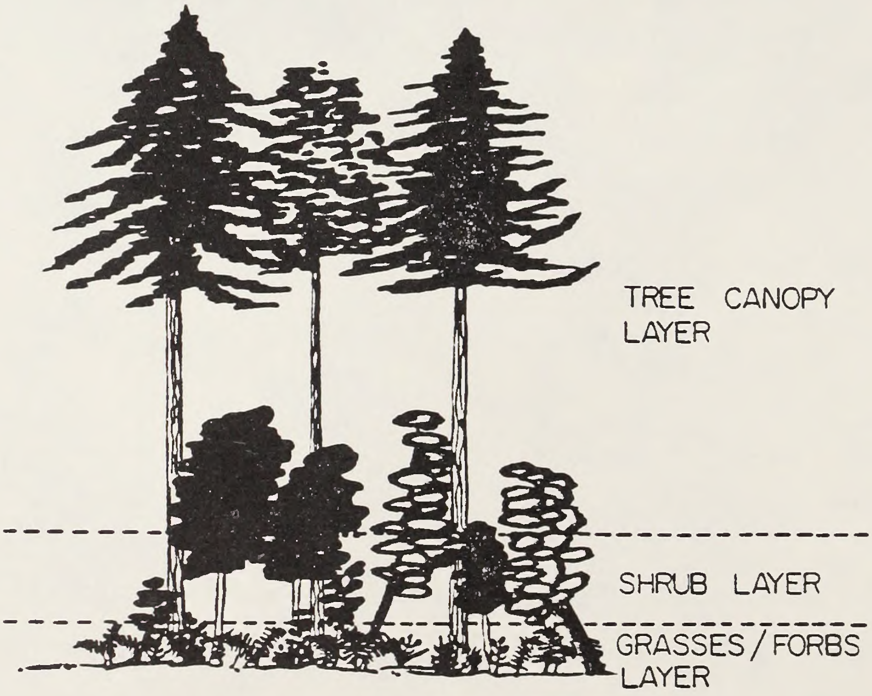
vertical space inhabited by grasses and forbs (see Figure 3-1).

Plants in the forest community are dynamic. They flourish or die out in response to the amount of sunlight, moisture, and nutrients available to them. Bare land is quickly invaded by a community of hardy pioneer species, which thrive in sunlight and high temperatures and produce shade. As the microenvironment then becomes altered, plants which need shade become established and replace the pioneer community. In turn, these plants are replaced by another seral community as succession progresses toward climax. Climax is reached when the plant community attains dynamic equilibrium with the environment. The climax plant community is the one which can sustain itself and is best adapted to the unique combination of environmental factors.

The forest lands were classified according to Daubenmire's habitat types (Daubenmire 1968). A habitat type is an area of land potentially capable of producing similar plant communities at climax. A habitat type may support a variety of disturbance-induced, or seral plant communities, but succession will produce similar plant communities at climax (Pfister 1977). The habitat types were next aggregated into the following seven series (a series is a group of habitat types with the same climax tree species): ponderosa pine, Douglas fir, grand fir, western hemlock, western red cedar, subalpine fir, and mountain hemlock. These series were then grouped into the three categories as follows (see also Maps 3-7 and 3-8).

Ponderosa Pine - Douglas Fir Series

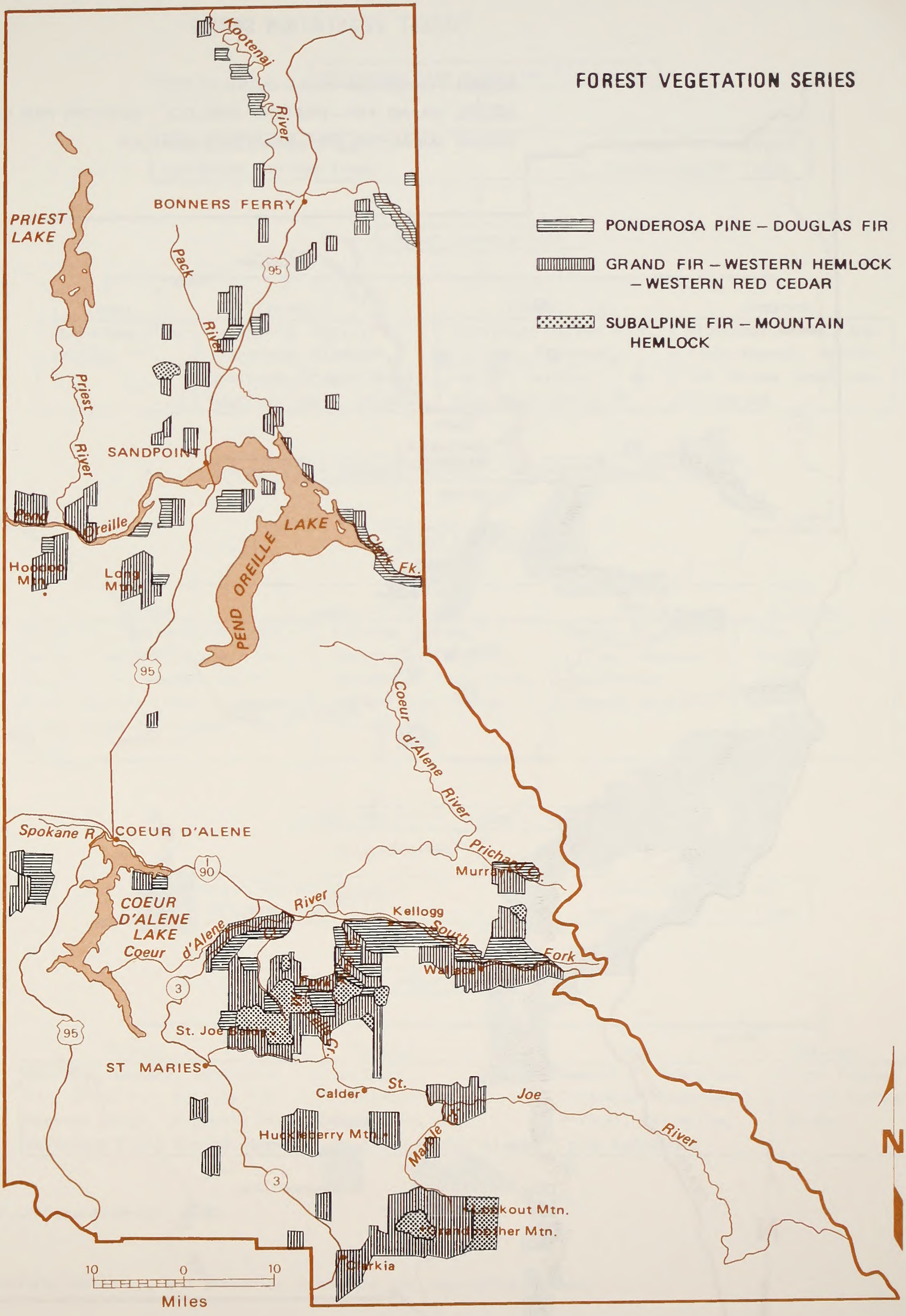
The ponderosa pine - Douglas fir series is found in the lowest and driest forested areas and is the second most important timber producing series in the district. Occurring at elevations ranging from 2,000 feet to 3,400 feet, this series group accounts for about 30 percent of the BLM forest land in the district. It is found mainly in the southern part of the district along the breaks of the Little and Main Salmon rivers and their tributaries. (Figure 3-2 identifies the major plant species in this series.)



SOURCE: BLM, Coeur d'Alene District, 1980.

Figure 3-1. Typical forest stratification.

COEUR D'ALENE DISTRICT MAP
NORTH HALF

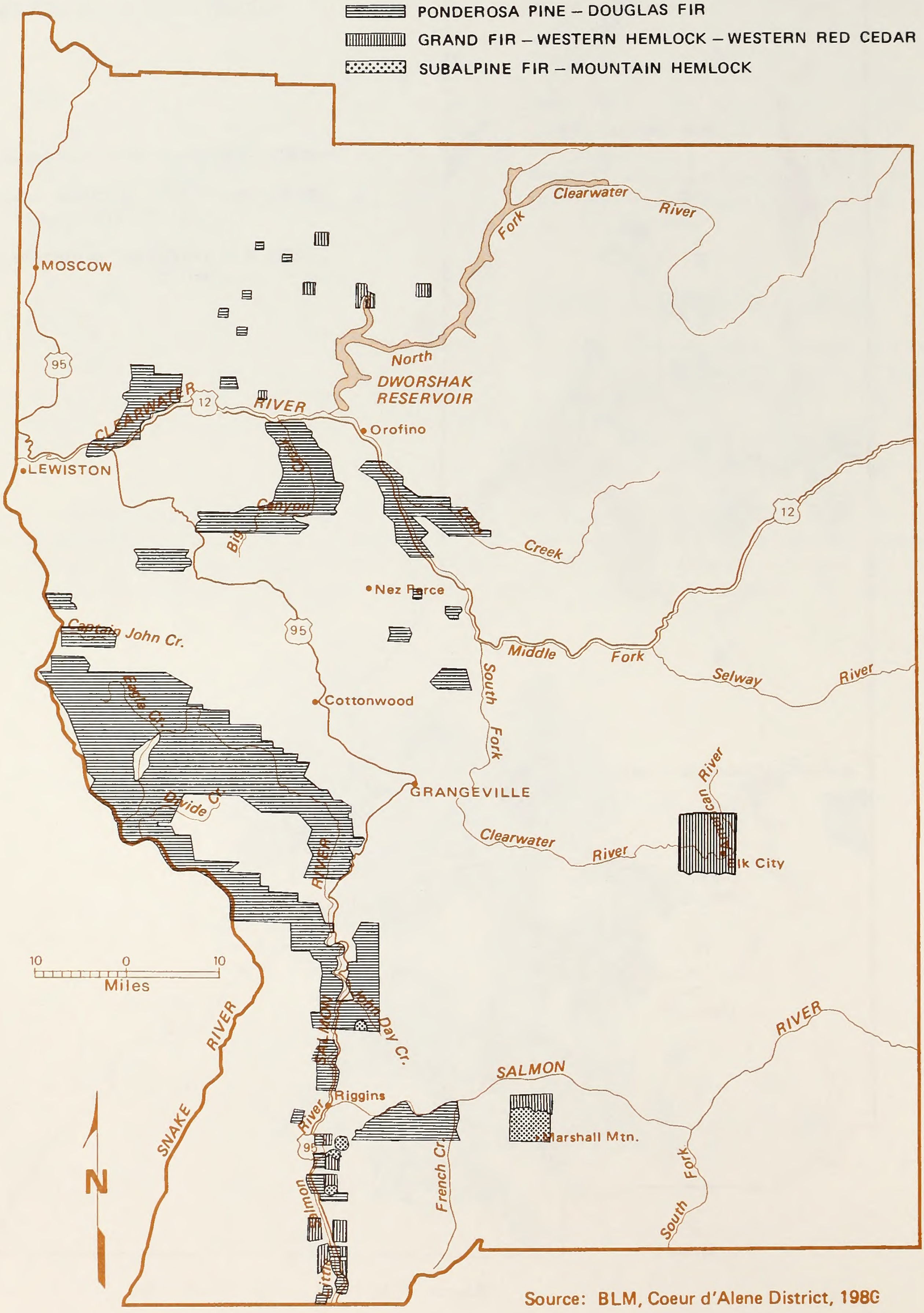


Source: BLM, Coeur d'Alene District, 1980.

MAP 3–7

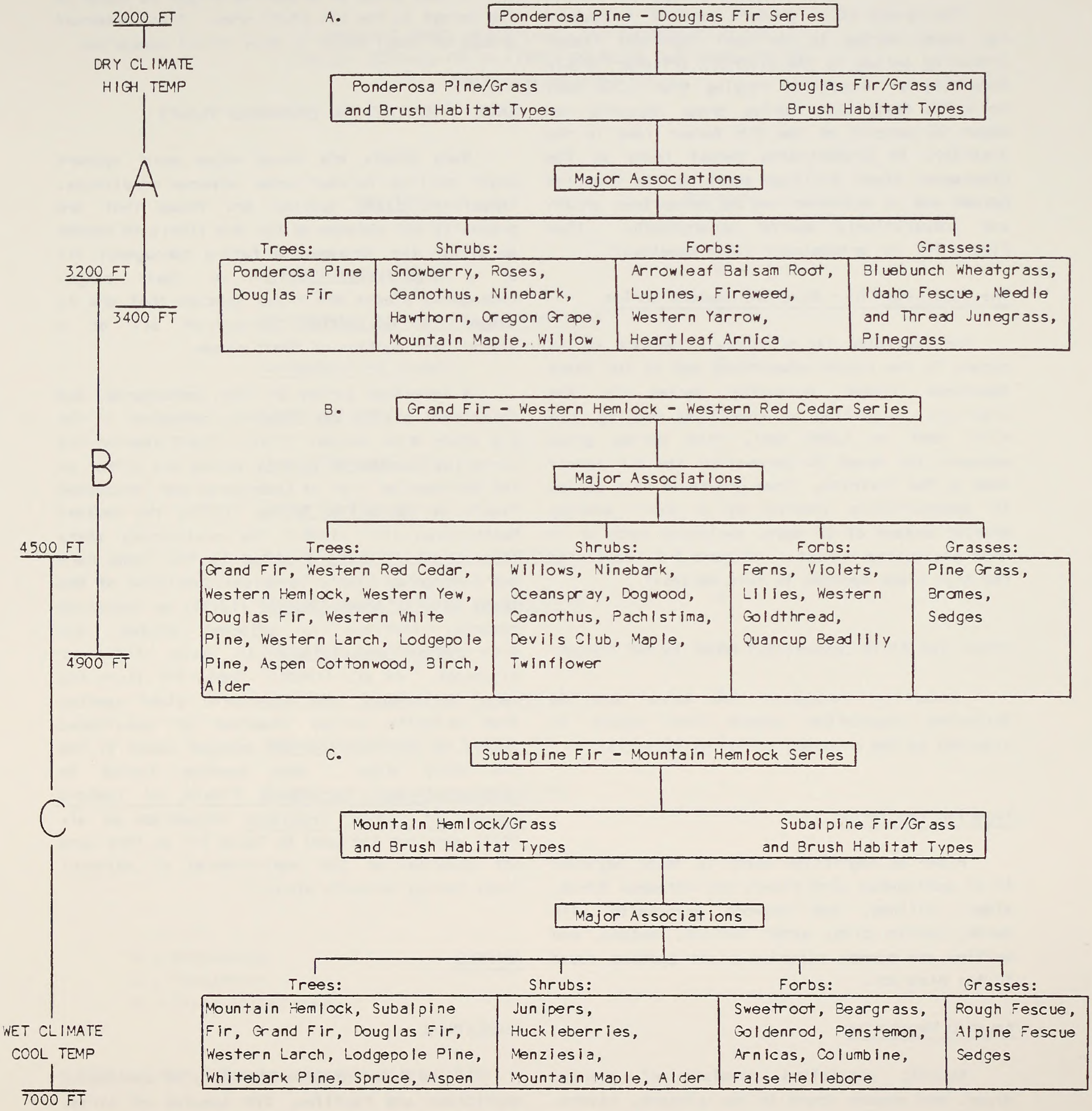
COEUR D'ALENE DISTRICT MAP
SOUTH HALF

FOREST VEGETATION SERIES



Source: BLM, Coeur d'Alene District, 1980

MAP 3–8


2000 FT
DRY CLIMATE
HIGH TEMP
A
3200 FT
3400 FT
B
4500 FT
4900 FT
C
WET CLIMATE
COOL TEMP
7000 FT
A.
Ponderosa Pine - Douglas Fir Series
Ponderosa Pine/Grass and Brush Habitat Types
Douglas Fir/Grass and Brush Habitat Types
Major Associations
B.
Grand Fir - Western Hemlock - Western Red Cedar Series
Major Associations
C.
Subalpine Fir - Mountain Hemlock Series
Mountain Hemlock/Grass and Brush Habitat Types
Subalpine Fir/Grass and Brush Habitat Types
Major Associations

Trees:	Shrubs:	Forbs:	Grasses:
Ponderosa Pine Douglas Fir	Snowberry, Roses, Ceanothus, Ninebark, Hawthorn, Oregon Grape, Mountain Maple, Willow	Arrowleaf Balsam Root, Lupines, Fireweed, Western Yarrow, Heartleaf Arnica	Bluebunch Wheatgrass, Idaho Fescue, Needle and Thread Junegrass, Pinegrass

Trees:	Shrubs:	Forbs:	Grasses:
Grand Fir, Western Red Cedar, Western Hemlock, Western Yew, Douglas Fir, Western White Pine, Western Larch, Lodgepole Pine, Aspen Cottonwood, Birch, Alder	Willows, Ninebark, Oceanspray, Dogwood, Ceanothus, Pachistima, Devils Club, Maple, Twinflower	Ferns, Violets, Lilies, Western Goldthread, Quancup Beadlily	Pine Grass, Bromes, Sedges

Trees:	Shrubs:	Forbs:	Grasses:
Mountain Hemlock, Subalpine Fir, Grand Fir, Douglas Fir, Western Larch, Lodgepole Pine, Whitebark Pine, Spruce, Aspen	Junipers, Huckleberries, Menziesia, Mountain Maple, Alder	Sweetroot, Beargrass, Goldenrod, Penstemon, Arnicas, Columbine, False Hellebore	Rough Fescue, Alpine Fescue Sedges

SOURCE: BLM, Coeur d'Alene District, 1980.

Figure 3-2. Temperature, moisture, and elevation gradients for vegetation series.

Grand Fir - Western Hemlock - Western Red Cedar Series

The grand fir - western hemlock - western red cedar series is the most important timber producing series in the district (Pfister 1976). Occurring at elevations ranging from 3,200 feet to 4,900 feet, this series group accounts for about 50 percent of the BLM forest land in the district. It predominates forest lands in the Clearwater River drainage north to the Canadian border and is characterized by dense tree growth and comparatively sparce undergrowth. (See Figure 3-2 for predominent plant species.)

The Subalpine Fir - Mountain Hemlock Series

The subalpine fir - mountain hemlock series occurs in the higher elevations and is the least important timber producing series in the district. Occurring at elevations ranging from 4,500 feet to 7,000 feet, this series group accounts for about 20 percent of the BLM forest land in the district. Tree growth in this series is substantially limited by a short average growing season of 90 days, excluding much of it from productive forest. (Figure 3-2 identifies the main plant species in this series.)

OTHER VEGETATIVE COMMUNITIES FOUND IN THE FOREST

Occurring throughout the forest are the following vegetation covers that could be affected by the proposed action of this EIS:

Riparian Vegetation

Riparian vegetation cover is found adjacent to or contiguous with rivers and streams. Birch, alder, willows, and dogwood associated with ferns, devils club, water hemlock, sedges, and nettles are common riparian plant species found in the district.

Aquatic Vegetation

Aquatic vegetation consists of plants, algae, and mosses found in the streams, rivers, lakes, and reservoirs throughout the forest. Cattails, sedges, weeds, rushes, wild rice, and horsetail plants comprise the majority of the species.

Moss and Fungi Communities

A moss group of bryophite origin is found in the forest in the EIS study area. Also, numerous groups of fungi occur in this forest ecosystem.

RARE, THREATENED AND ENDANGERED PLANTS

Rare plants are those whose small numbers might decline further under adverse conditions. Threatened plant species are those that are presently not endangered but are likely to become so within the foreseeable future throughout all or a significant portion of their range. Endangered plants are those species that are in danger of extinction throughout all or a significant portion of their range.

A botanical survey of rare, endangered, and threatened plants was recently conducted in the EIS study area (Heidel 1979). Plant species and varieties considered in this survey are either on the Smithsonian list of Endangered and Threatened Plants of the United States (1975); the revised Smithsonian list (1978); the preliminary state list of rare plants prepared by the Idaho Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council (1979); or herbarium records, listings in adjacent states, and distribution descriptions in Davis (1952) or Hitchcock et al. (1969). Table 3-7 lists the rare, threatened, and endangered plant species from Heidel's survey observed or considered likely to be found on BLM managed lands in the EIS study area. Some species listed in Endangered and Threatened Plants of Idaho-a Summary of Current Knowledge (Henderson et al. 1977) were not included in Table 3-7 as they were not observed on BLM administered or adjacent lands during Heidel's study.

ANIMALS

TERRESTRIAL

In the Coeur d'Alene District, 24 species of amphibians and reptiles, 228 species of birds, and 79 species of mammals are known or likely to occur. A list of these species and their season of use in the area is available in the Coeur d'Alene BLM District Office.

TABLE 3-7

PROPOSED RARE, THREATENED, AND ENDANGERED PLANT SPECIES OBSERVED ON OR LIKELY TO BE ON BLM LANDS IN THE COEUR D'ALENE DISTRICT

Species	Status[1]
Cardamine constancei	E
Calachortus macrocarpus v. maculosus	R
Calamagrostis tweedyi	T
Carex eurycarpa	R
Dodecathon dentatum	R
Hackelia hispida	T
Halimolobos perplexa v. perplexa	T
Hydrophyllum fendleri v. albifrons	R
Mirabilis macfarlanei	E
Penstemon glandulosus v. glandulosus	T
Sedum lanceolatum v. rupicolum	T
Trifolium plumosum v. amplifolium	T

---

[1] E = Endangered
T = Threatened
R = State listed rare

SOURCE: BLM, Coeur d'Alene District, 1979.

Type and density of vegetation is of primary importance to the distribution, diversity, and abundance of animals. The vegetation zones previously described in this chapter contain several plant communities in different successional or seral stages. The diversity of these communities and successional stages accounts for the diversity of animals found in the district. An intensive wildlife habitat inventory performed by the University of Idaho (Keay and Garton 1978; Stauffer, Kronemann and Garton 1979) identified the various plant communities on 75,000 acres of public land in the EIS study area and is available in the Coeur d'Alene District Office.

An animal species' physical or behavorial characteristics may limit it to a particular vegetation zone or successional stage within a zone. However, animal species with wide habitat tolerances may occupy different vegetation zones and different successional stages when the environments are similar.

Table A of Appendix 3-2 lists terrestrial vertebrates that would most likely be affected by timber harvest and associated activities in the EIS study area or that have special status. The table also gives information on their life histories, populations, and habitat, and indicates their significance in the area. The criteria used to select these species and their significance are also discussed. Following is a discussion of the significant animal species that inhabit the EIS study area:

Endangered, Threatened and Sensitive Species

There are three endangered species (the bald eagle, peregrine falcon, and Rocky Mountain Wolf) and one threatened species (the grizzly bear) in northern Idaho. In addition, there are 17 species listed as sensitive by agreement with Idaho Department of Fish and Game (see Appendix 3-2, Table B for listing).

Big Game

Elk

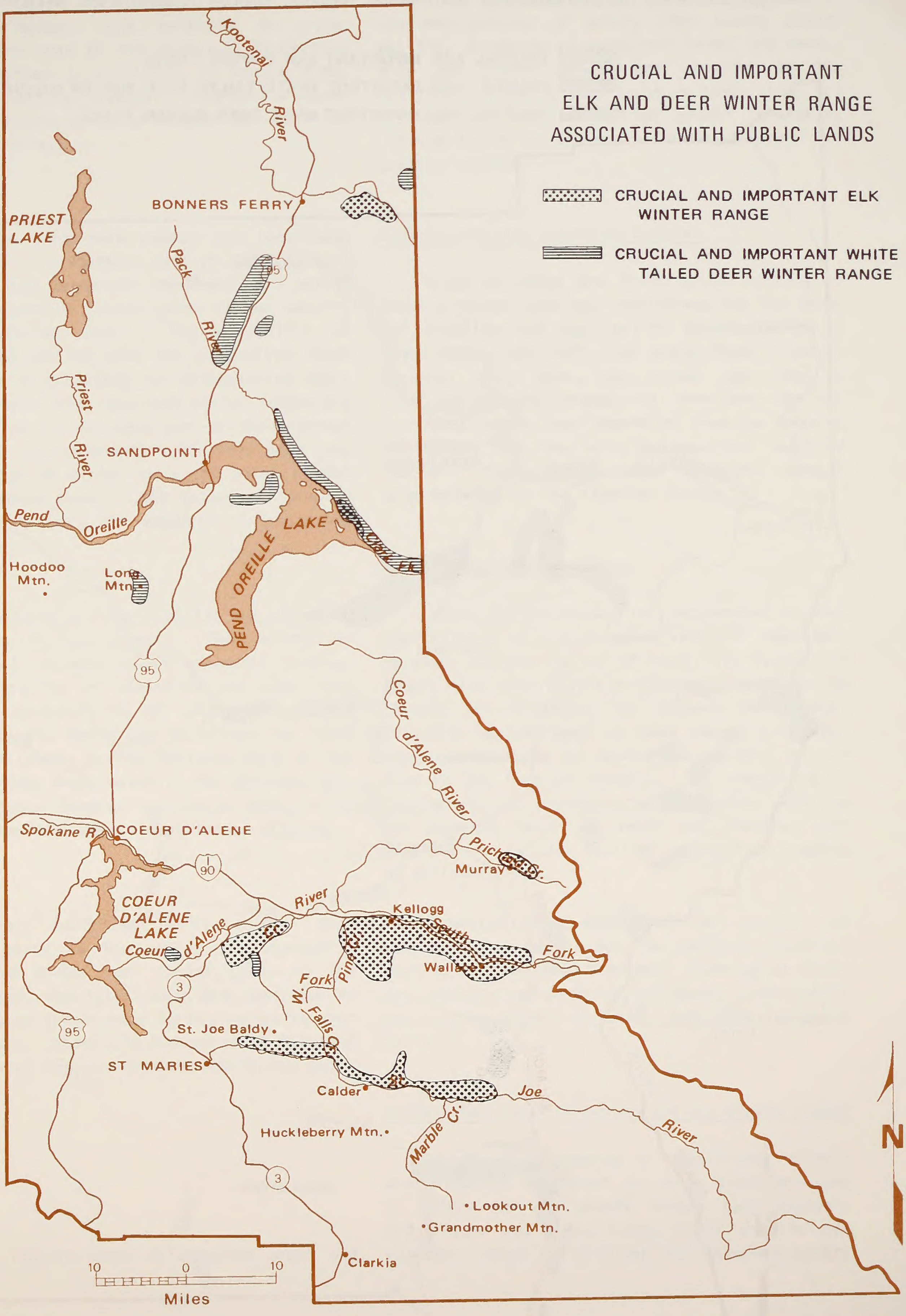
Elk in northern Idaho are limited primarily by winter range. Winter range is generally on southerly facing slopes where snow depths do not exceed 2 feet, which is usually below 4,000 feet in elevation. Winter ranges on BLM land range from seral brushlands in the northern part of the district to grasslands in the southern portion. Winter ranges are generally in poor to fair condition because of decadence, unavailability to elk because of height or dead material, and invasion of conifers during the successional process. An estimated 2,000 to 2,200 elk winter on 39,300 acres of crucial or important BLM elk winter range in the district (see Maps 3-9 and 3-10). Of these lands, 1,900 acres are grassland supporting approximately 300 elk.

Important summer range in the district provides crucial habitat for nourishment of pregnant females, calving grounds, rut areas, and wallow areas as well as security from disturbance. Other summer ranges provide feeding areas, travel ways, and cover. The larger blocks of BLM summer range comprise approximately 131,000 acres and include the area between the Coeur d'Alene and St. Joe rivers; the Grandmother Mountain-Lookout Mountain area; Joseph Plains area; John Day Mountain area; Little Salmon area; Marshall Mountain area; Lolo Creek area; Elk City area; and areas east of Riggins. Of these areas, about 13,100 acres, or 10 percent, are important or key habitat (from wildlife habitat inventory data of Keay and Garton 1978; Stauffer, Kronemann, and Garton 1979). As of March 1980, elk summer range on BLM land is estimated at 39 percent below optimum quality because of roads, undesirable cover/forage ratios, etc., (see Appendix 2-3).

White-tailed Deer

White-tailed deer are common in the northern half of the district. Riparian areas are an important component of white-tailed deer habitat, and edges of vegetation types are preferred use areas. White-tailed deer winter ranges are generally comprised of southerly facing slopes below 2,500 feet, riparian areas, or agricultural lands where snow depths do not exceed 1.5 feet. Crucial and important white-tailed deer winter ranges are illustrated on Maps 3-9 and 3-10. Total numbers of white-tailed deer using winter range on BLM lands in the district are not available; however, it is known that approximately 500 white-tailed deer use 7,400 acres of

COEUR D'ALENE DISTRICT MAP
NORTH HALF

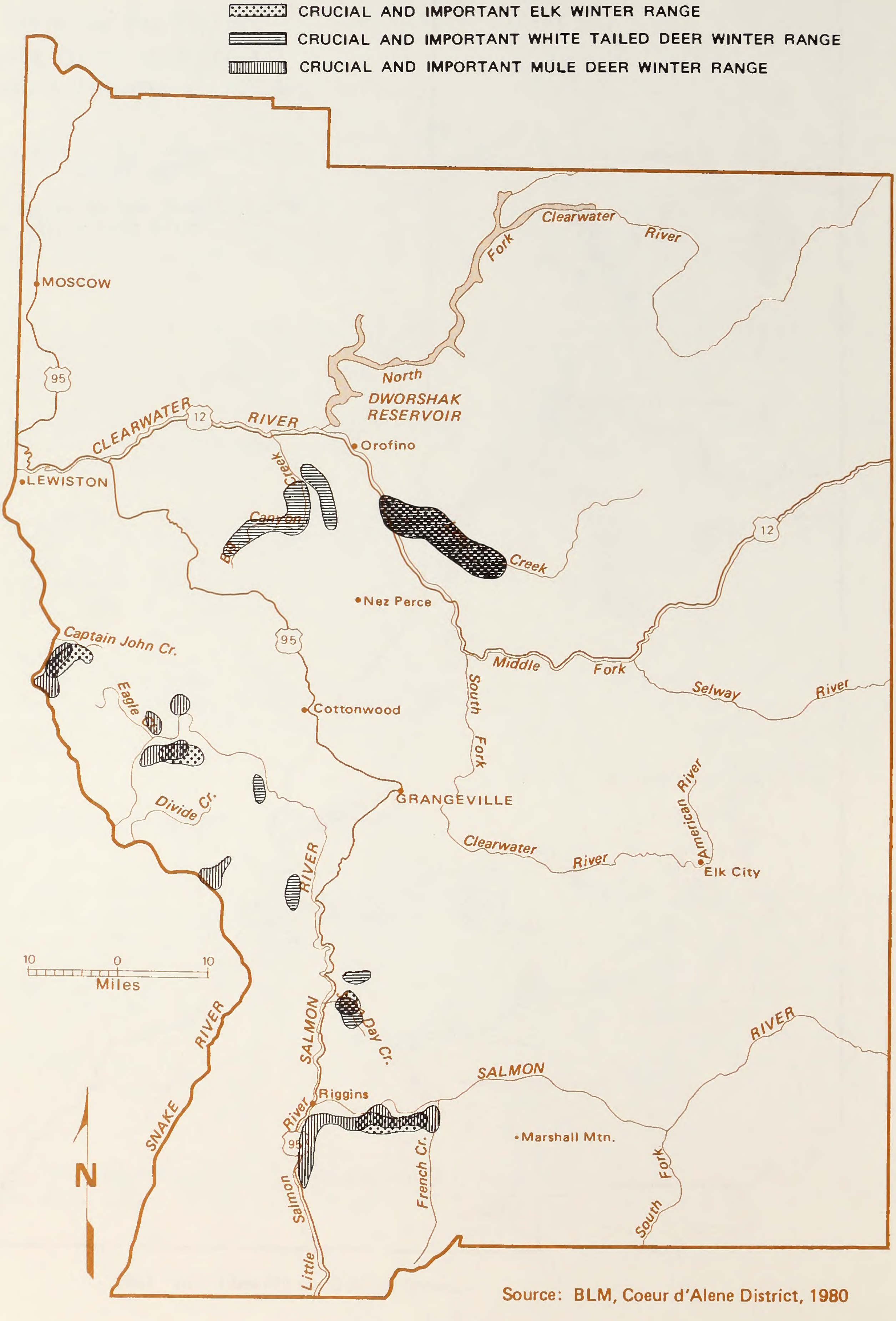


Source: BLM, Coeur d'Alene District, 1980.

MAP 3–9

COEUR D'ALENE DISTRICT MAP
SOUTH HALF

CRUCIAL AND IMPORTANT ELK AND DEER WINTER RANGE ASSOCIATED WITH PUBLIC LANDS



Source: BLM, Coeur d'Alene District, 1980

MAP 3–10

the winter range (see Maps 3-9 and 3-10). Significant numbers are believed to occur throughout the rest of the district. Protective cover is important in midwinter, at fawning time, and during hunting seasons. Protective cover adjacent to forage areas is crucial for survival in severe winters.

Mule Deer

Mule deer are more common and considered significant in the southern half of the district. They range from grassland to timber and alpine types and generally inhabit more rugged country than white-tailed deer. Characteristics of winter ranges and the need for protective cover are the same as discussed for white-tailed deer. Mule deer crucial and important winter ranges are illustrated for the southern part of the district on Map 3-10. Approximately 1,950 mule deer have been estimated to winter on 9,450 acres of BLM lands. Of these lands, 4,000 acres are forested and support 350 deer; the remainder is grassland.

Moose

Moose extensively use riparian and wet areas for foraging in the summer. They winter in mature mixed forests where overstory canopy cover, topography, or elevation are such that snow depths generally do not exceed 36 inches. Thirty moose are estimated to winter on 1,300 acres of BLM lands in the southern half of the district. Moose areas exist in the northern half of the district. None of the public lands in the EIS study area have been classified as crucial.

Black bear

Areas on southerly facing slopes that "green-up" early in the spring are especially important for black bear forage areas in the spring, summer, and fall. Bear are sensitive to disturbances on these areas during the particular season of use. About 216,000 acres of BLM land provide habitat for an estimated 400 to 500 bear.

Upland Game

Grouse

Grouse require moist or riparian areas and prefer wet meadow areas to rear broods because of the availability of water, high insect availability, abundance of succulent forbs, and cover. Blue and ruffed grouse are abundant in the district. Drumming logs found in these areas are an important part of ruffed grouse courtship. Grouse winter in densely timbered areas and eat conifer needles.

Riparian Habitat Dependent Species

Riparian areas are important or crucial to several animal species. Amphibians use the areas for breeding and egg laying; shrews forage in these areas; many bats feed along them; fishers, martens, elk, deer, and moose use them as corridors between ranges; elk often use them for wallowing areas; deer depend on them for fawning and cover; and they provide important songbird habitat. The greatest number of animal species usually occur in the riparian zones.

Animals Dependent on Snags

There are 30 terrestrial vertebrates meeting the criteria of significance that are dependent on snags for part or all of their life cycle. Of these, nine species are woodpeckers which can be classed as drillers, or primary excavaters. Drillers require snags or dead topped trees for nest construction by excavation as well as for food in the form of insects. The remaining 21 species include secondary cavity nesters which do not excavate their own nests but, instead, are dependent on natural cavities or cavities created by drillers.

Numerous other animal species use but are not dependent upon snags for cavities, perches, nest sites, and food sources. Examples of these are raccoon, red squirrel, chipmunk, great horned owl, other birds of prey, and many perching birds.

Animals Dependent on Mature and Old Growth Timber

Twenty-eight species of significant animals are primarily dependent on large trees provided by mature and old growth stands (see Appendix 3-2, Table A). The large trees provide replacement snags for drillers and secondary cavity nesters, perches, and nest areas for other bird species.

High Interest Species and Species that Occupy Unique or Limited Habitats

Several species or groups of species are of interest or occupy unique or limited habitats in north Idaho. These include raptors not already discussed such as the red-tailed hawk and the sharp-shinned hawk; the pika, which is limited to talus rock slide areas; the northern bog lemming (limited to wet areas), the occurrence of which is suspected but not confirmed; and the Columbian tiger beetle, which occurs in the Lower Salmon River area.

AQUATIC

Fish

Two distinct types of river fisheries systems exist within the district, those that support anadromous fisheries (fish that run from freshwater to the ocean and back during their life cycle) and those that support resident fisheries. The Salmon, Clearwater, and Snake rivers and some of their tributaries support both anadromous and resident fisheries. The Pend Oreille, Spokane, and Kootenai rivers and their tributaries contain only resident fisheries. A number of lower elevation natural and manmade lakes and high mountain lakes occur in the district as well.

There are 17 species of coldwater fish and 26 species of warmwater fish in the district. Only those species that are of economic value or high public interest will be discussed. (For a complete list of species, see Unit Resource Analysis Step II located in the Coeur d'Alene District Office.) Major fish inventories that have been done in the area include Ringe et al. 1978; Murphy and Metsker 1962; and Welsh et al. 1965.

Coldwater Game Fish

Anadromous Game Fish. Anadromous fish present include chinook salmon, sockeye salmon, and steelhead trout and are classified sensitive by BLM. In terms of BLM administered habitat, anadromous fish are the most economically important species in the district (see summary of game fish habitat in Table 3-8) and are much sought after game fish. See Map 3-11 for important anadromous fish habitat in the district. They also provide some Indian subsistance fisheries and contribute to off-site commercial fisheries. The number of salmon and steelhead has been greatly reduced due to loss of habitat, migration barriers, drouth, and possibly over fishing.

Chinook spawning is not known to occur on BLM habitat within the district. However, chinook presmolt and smolt (a young migrating salmon) rearing areas occur on the following BLM administered streams: Whiskey, Kirks Fork, Cottonwood, Hazard, Deer, and Deep Creeks and the American and East Fork American rivers. Sockeye salmon do not spawn on BLM administered habitat but do pass through BLM habitat enroute to off-site spawning areas. Suitable steelhead spawning and rearing habitat occurs on most BLM administered streams that drain into the Clearwater and Salmon rivers. (For a complete list of streams, refer to Unit Resource Analysis Step III located in the Coeur d'Alene District Office.)

Smolts from all three anadromous species pass through BLM habitat on the lower Salmon River enroute to the ocean. Upstream spawners and smolts of chinook and steelhead pass through BLM habitat on the Clearwater River, but due to the scattered ownership pattern of BLM land on the mainstem Clearwater, this habitat has less impact on them than BLM habitat on the Salmon River.

Resident Game Fish. Coldwater resident game fish found in the district include rainbow trout, cutthroat trout (a sensitive species), brook trout, dolly varden, whitefish, and grayling. Rainbow trout, brook trout, and grayling are introduced species. Kokanee salmon, an introduced non-migratory form of sockeye salmon, is an important game fish in the larger lakes in the northern portion of the district but does not occur on BLM administered habitat.

Waters of the Idaho batholith are not

TABLE 3-8
SUMMARY OF GAME FISH HABITAT

STREAM DWELLING GAME FISH HABITAT
HABITAT STATUS

Species	Stream Miles of Habitat		Habitat Status	
	Est. Total[1]	Est. BLM	Quality	Quantity
Salmon and Steelhead	1780-2100	184	From poor to excellent	Stable to decreasing
Resident trout	10,000+	250	From poor to excellent	Stable to decreasing
Warmwater	113+	87	Good	Stable
Sturgeon	165+	87	Good	Stable

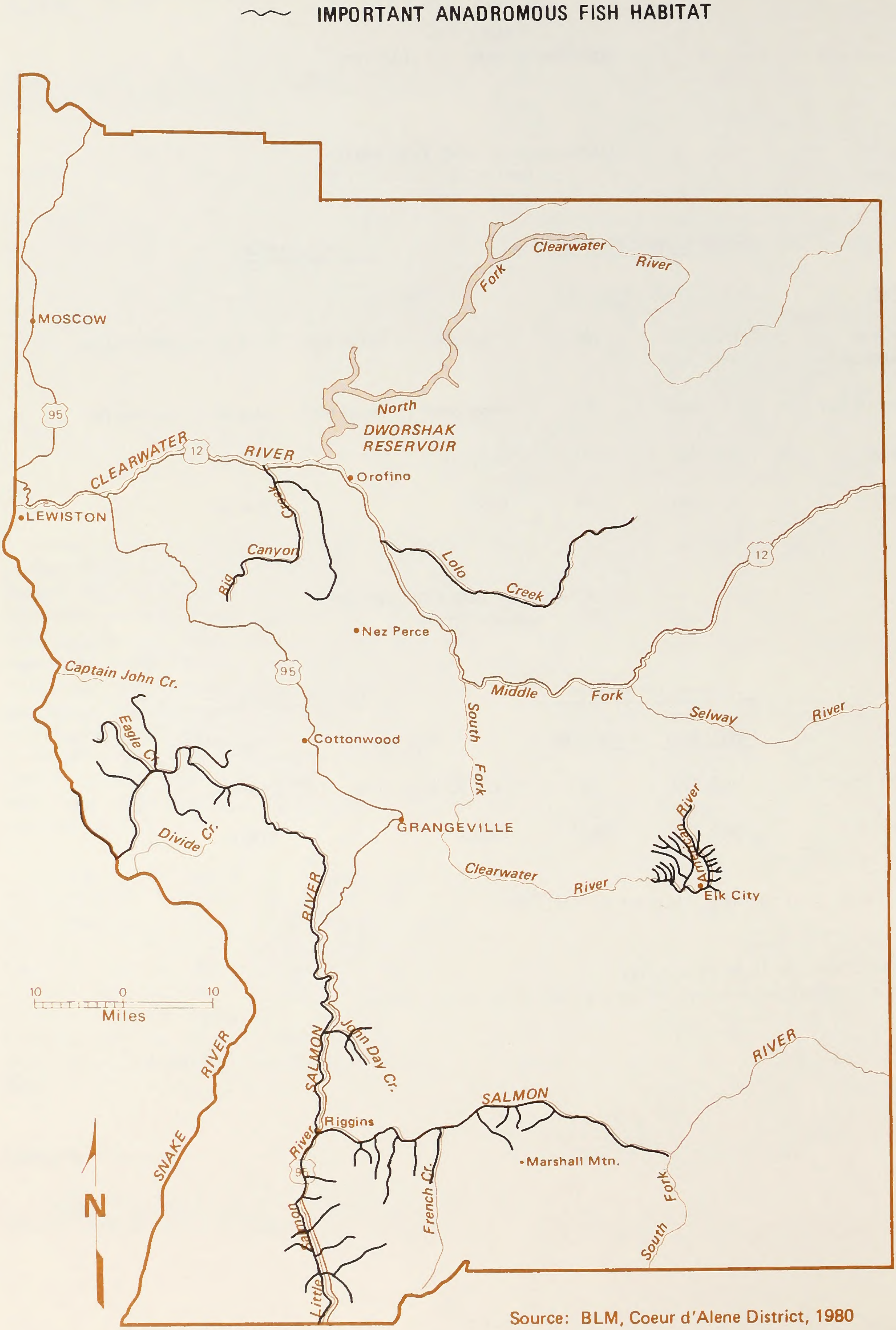
LAKE DWELLING GAME FISH HABITAT
HABITAT STATUS

Species	Acres of Habitat		Habitat Status	
	Est. Total[1]	Est. BLM	Quality	Quantity
Resident trout	163,200	69	Fair to excellent	Stable
Warmwater	165,700	800[2]	Unknown	Stable

SOURCE: BLM, Coeur d'Alene District Office, 1979.

[1] Figure is for the Idaho Panhandle.
[2] The BLM controls only a portion of the shoreline on two lakes.

COEUR D'ALENE DISTRICT MAP
SOUTH HALF



Source: BLM, Coeur d'Alene District, 1980

MAP 3–11

productive fisheries due to their lack of nutrients. Consequently, fish harvest is closely regulated to maintain desired fish populations. Loss of habitat due to man's activities is a district-wide problem. The larger land blocks containing BLM habitat have the greatest potential for conflict with timber harvest. (See the large District Map in the backcover packet.)

Warmwater and Coolwater Game Fish

Largemouth bass, channel catfish, brown bullhead, and black crappie are present in the warmer lakes. Bass are present in the Salmon and Snake rivers. White sturgeon (a coolwater species) are present in limited numbers in the Snake, Salmon, and Kootenai rivers and are classified sensitive.

Nongame Fish

Nearly all streams in the district support some nongame fish. Their habitat requirements are similar to other warmwater and coldwater fish. Since none of this category of fish are threatened, endangered, sensitive, or of signicant economic or social value, they will not be discussed further.

Other Aquatic Forms

Bullfrogs

Bullfrogs are mostly aquatic and in Idaho are classified as game fish. Although their occurence on BLM administered land is not known, it is thought to be insignificant and, therefore, will not be discussed further.

Aquatic Invertebrates

Streams in the district support a variety of invertebrate species which are important for fish forage. No sensitive, threatened, or endangered aquatic invertebrates are known to occur in the district.

CULTURAL RESOURCES

INTRODUCTION

Cultural resources represent a part of the continuum of events from the earliest evidences of man to the present day. They are often discussed as physical remains of both prehistoric and historic activities and include artifacts, structures, sites, and other evidence of human activity. Prehistoric resources are defined as those resources associated with activities before written history. Historic resources are defined as those resources associated with activities after written histories were kept. Cultural resources can also be discussed in terms of areas where significant human events occurred, even though physical evidence no longer remains.

Cultural resource data for the EIS area was compiled from a variety of sources. A Class II cultural resource inventory (see Appendix 3-3 for details) was conducted by BLM personnel over the last 3 years. The inventory included a field examination of sample areas throughout the district tailored to the scattered land ownership. Data was also compiled from other inventories and site-specific project clearances including those for timber sales and land exchanges.

The State Historic Preservation Officer (SHPO) was contacted and asked to identify sites and/or areas on or eligible for nomination to the National Register of Historic Places. The most recent listing of the National Register of Historic Places was consulted as well as the monthly supplements. Table 3-9 lists those sites and areas that are on or near BLM lands. The BLM will seek a formal determination of eligibility from the Keeper of the National Register for those sites or areas identified as eligible by the BLM in consultation with the State Historic Preservation Officer.

PREHISTORIC RESOURCES

Prehistoric resource data for this EIS was gathered utilizing the previously mentioned sources. No predictive model has been developed

TABLE 3-9

NATIONAL REGISTER OF HISTORIC PLACES
LISTING OF PROPERTIES OR ELIGIBLE PROPERTIES

NAME	CHARACTERISTICS	OWNERSHIP	COMMENTS
Burgdorf	Historic hotel	Private	Entered on National Register 4-14-72
Lolo Trail	Prehistoric and historic trail	USFS/Private	Entered on National Register 10-15-66
Weippe Prairie	Prehistoric use and first meeting place between the Nez Perce and Lewis and Clark	State of Idaho/ Private	Entered on National Register 10-15-66
Elk City Historic Mining District	Historic mining from the 1860s including lode, placer and dredging.	BLM/USFS/Private	Eligible for the National Register
Warren Townsite	Historic mining district near Burgdorf	BLM/USFS/Private	Eligible for the National Register
Rochat Mountain Area	Coeur d'Alene Tribe ceremonial and religious activities	BLM/Private	Eligible for the National Register
Silver Belt Mining Area	Historic mining activity	BLM/Private	Eligible for the National Register
Marble Creek Historic District	Historic logging activity	USFS/BLM	Eligible for the National Register
Golden Anchor Mine	Historic mining activity	Private/BLM	Eligible for the National Register
Murray Historic District	Mining and other historic activities	Private/BLM	Eligible for the National Register
Mullan Trail	Historic trail	USFS/Private	Eligible for the National Register

SOURCE: BLM, Coeur d'Alene District, 1980.

to determine projected densities or types of prehistoric sites.

Evidence of human use in the area ranges from winter villages along the major rivers to campsites in the upland areas. The archaeological record indicates that the area has been inhabited for the last 8,000 years. A more detailed discussion of the prehistoric resources and Native American use of the EIS area can be found in the Unit Resource Analysis (URA) located at the BLM District Office in Coeur d'Alene.

HISTORIC RESOURCES

Historic resource data for this EIS was gathered utilizing the previously mentioned sources. No predictive model has been developed for the EIS area to determine projected densities or types of historic sites.

Historic use of the area began in the 1860s with the discovery of gold. The historic resources are extremely varied including mining (lode and placer), logging, and homesteading. A discussion of the historic resources within the EIS area is included in the URA.

Damage to cultural resources has resulted from a variety of activities including timber harvest activities, vandalism, road construction, and natural deterioration.

VISUAL RESOURCES

The BLM visual resource management (VRM) system described in BLM Manual 8400 was used to evaluate the quality and importance of the visual resource (scenery). The VRM classes are determined by scenic quality, visual sensitivity, and distance zones. The VRM classes of the district are shown on Maps 3-12 and 3-13, and BLM acres by class are tabulated in Table 3-10.

For each of five VRM classes, specific management objectives have been established that allow for differing degrees of contrast from a landscape's existing character and its character after any management activity. A contrast rating methodology described in BLM Manual 8431 is used to measure the degree of contrast that would be caused by a management action to determine which VRM class objective(s) would be met. The VRM class objectives are defined as follows:

Class I: Class I provides primarily for natural ecological changes only. It is applied to primitive areas, some natural areas, and other similar situations where management activities are to be restricted. The contrast rating shall not exceed nine points.

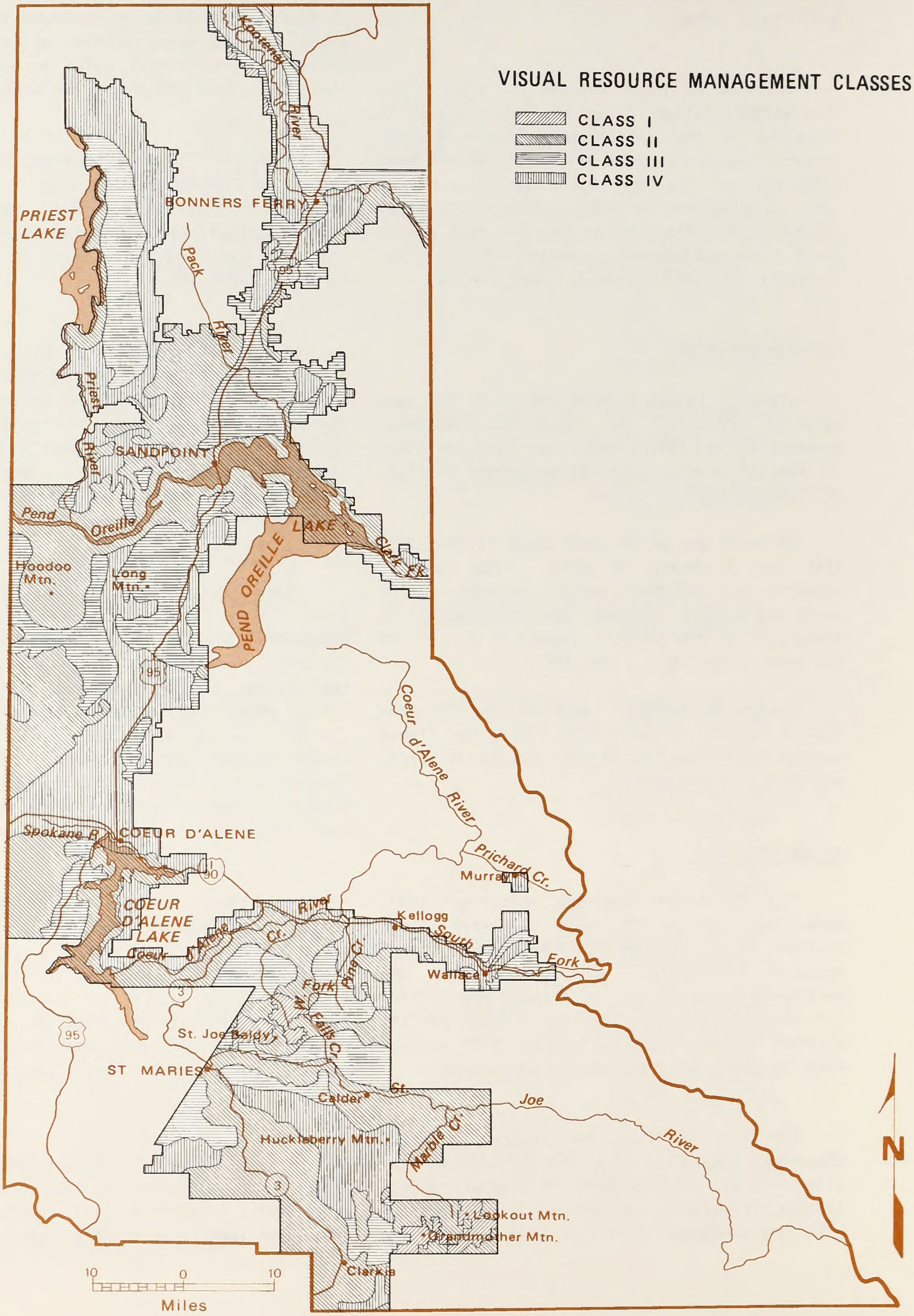
Class II: Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the characteristic landscape in Class II. The contrast rating shall not exceed 10 points. Timber management activities should not be evident from a travel route or use area from a distance of .5 mile.

Class III: Changes in the basic elements (form, line, color, texture) caused by a management activity may be evident in the characteristic landscape in Class III. However, the changes should remain subordinate to the visual strength of the existing character. The contrast rating shall not exceed 16 points. Timber harvest activities could be visible to observers, especially in the foreground (0 to 5 miles). Clearcut areas and road cut and fills could be evident to the casual observer.

Class IV: Changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape in Class IV. The contrast rating shall not exceed 20 points. Timber harvest activities could be obvious to all observers. Timber management activities could dominate the landscape from views of .5 mile or less.

Class V: Class V applies to areas where the naturalistic character has been disturbed to a point where rehabilitation is needed. No BLM areas were identified in this class.

COEUR D'ALENE DISTRICT MAP
NORTH HALF

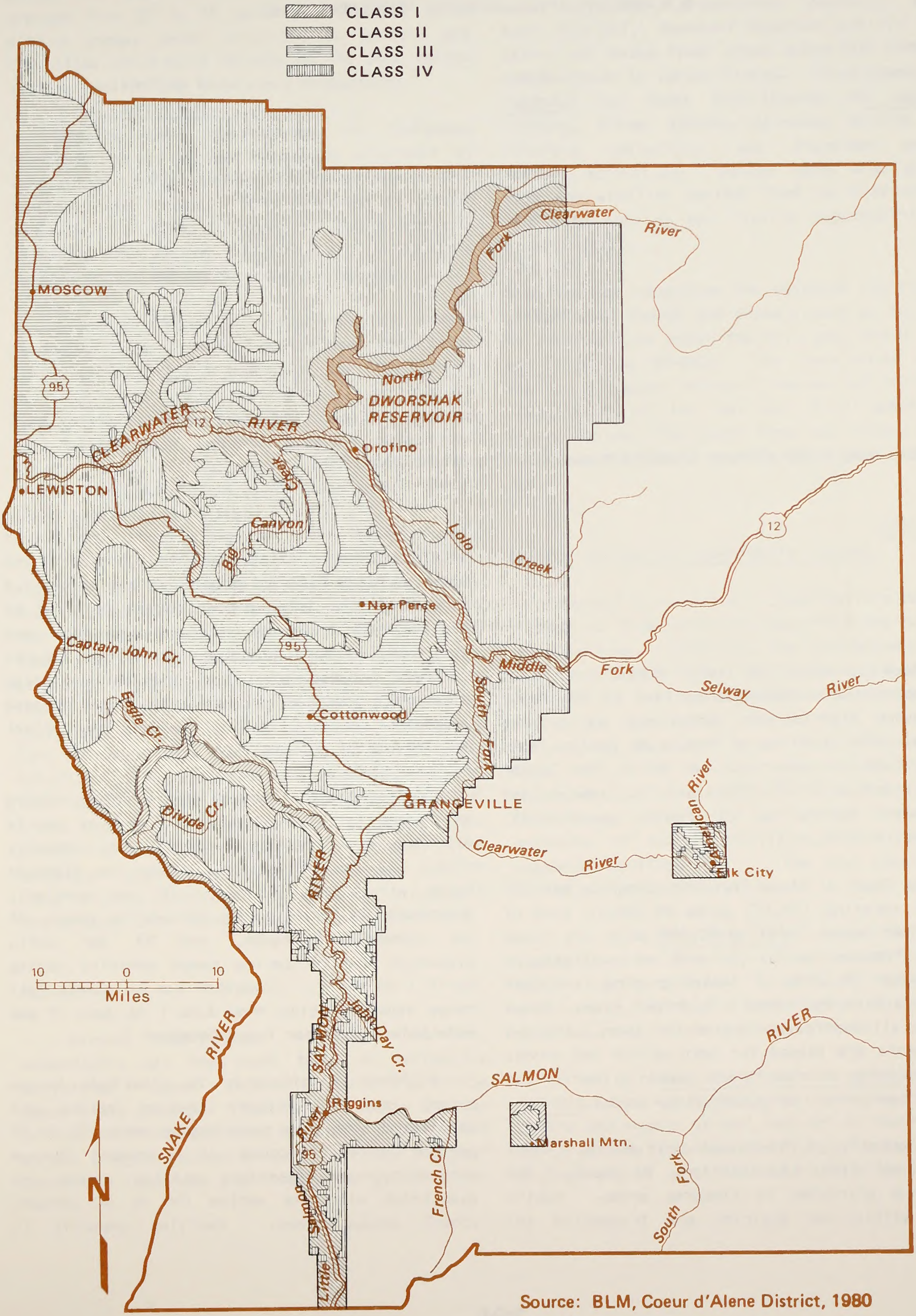


Source: BLM, Coeur d'Alene District, 1980.

MAP 3–12

COEUR D'ALENE DISTRICT
SOUTH HALF

VISUAL RESOURCE MANAGEMENT CLASSES



Source: BLM, Coeur d'Alene District, 1980

MAP 3–13

TABLE 3-10

BLM ACRES BY VISUAL RESOURCE MANAGEMENT CLASS

VRM Management Class	BLM Acres	% of Total BLM Acres
I	57,206	21%
II	122,297	45%
III	40,389	15%
IV	51,533	19%
V	0	0
Total	271,425	100%

SOURCE: BLM, Coeur d'Alene District Management Framework Plan 1979.

LAND USES

GRAZING

Livestock grazing on all Bureau of Land Management (BLM) administered land in the Coeur d' Alene District is authorized by grazing leases. The granting of leases on public lands is authorized under Section 15 of the Taylor Grazing Act (June 28, 1934) and the Federal Land Management and Policy Act (Public Law 94-579), enacted in 1976.

The Coeur d' Alene District currently has 168 leases covering 119,472 acres of public land of which 107 leases totaling 65,366 acres are found within timbered lands. Data is not available on the number of acres of leased grazing land that exists within the commercial forest base. Three of the allotments are leased for sheep, and two allotments are leased for both cattle and sheep. The remaining allotments are leased primarily for cattle use and a low amount of horse use.

Presently, 7,255 Animal Unit Months (AUMs) are leased within the district. Of these, 3,286 AUMs are allocated in timbered areas. Public lands within the district are fragmented and intermingled with private, state, or Forest Service lands. Grazing lands administered by the Coeur d' Alene District provide approximately 1.4 percent of the total annual forage utilized by the lessee's livestock. Lessee dependence upon BLM lands is more pronounced than the figures indicate because access to some key watering areas must occur across public lands and because management actions on public lands may affect grazing use of private lands.

Leased public timbered land provides spring and summer-fall forage and the season of use is dependent on elevation, aspect, and community type. Of the 107 grazing lessees on timbered lands within the district, 18 are partially dependent on public lands for spring range, 48 for summer-fall range, and 53 for both. Livestock use on spring range normally begins April 1 to May 1. Livestock use on summer-fall range usually begins from June 1 to June 15 and ends between October 1 and December 1.

A direct relationship to livestock forage canopy cover. Primary grazing values are associated with more open canopy areas (0 to 35 percent cover) because of increased forage production, and secondary grazing values are associated with the medium (36 to 60 percent cover) canopy areas. Carrying capacity in timbered areas with open to medium canopy cover within the same habitat type can vary on the average from 20 to 50 percent. Timbered areas with a canopy cover exceeding 60 percent are classified unsuitable because of the poor forage quality and the low understory production.

Logging opens the canopy and increases livestock forage values within an allotment by increasing the production of palatible forbs, grasses, and shrubs. This increase in forage continues for 10 to 20 years following harvest. Following this period, conifers begin to dominate causing forage values to steadily decline.

Livestock tend to concentrate in timber harvested areas (cutting units) when they occur within an allotment in the district. The cutting units are usually more moderately sloped than the surrounding timbered areas and contain roads and skid trails that improve livestock access and forage quality. This results in a distribution problem and some overuse of the better forage areas within these units.

Photo trend studies have been initiated on eight of the allotments within timbered areas. Four exclosures have also been constructed on four additional allotments to determine trend. These studies have shown that trend is presently stable on most of these allotments. Currently, there are two allotments totaling 1,535 acres that have grazing systems on them. The Kirks Fork allotment (No. 6261), a three pasture rest rotation system, was developed cooperatively with the lessee, Forest Service, and the Coeur d' Alene District. The Big Creek allotment (No. 6158), a deferred rotation allotment, was developed cooperatively with the lessee and the Coeur d'Alene District. The remaining allotments are managed under annual seasonal systems.

RECREATION

Within the Coeur d'Alene District, essentially all the local types of recreation activities occur within all recreation opportunity classes. However, primarily because of the small and scattered ownership pattern, BLM is not a major recreation supplier. For the most part, BLM lands are used inadvertently and often unknowingly by recreationists in conjunction with use on other land ownerships. Noted exceptions are the Rochat, Grandmother Mountain, Silver Belt, Elk City, Marshall Mountain and the lower Salmon and Snake river areas where BLM lands are concentrated in larger blocks. These areas have regional and local significance for hunting, fishing, winter sports, off-road vehicle use, minerals collecting, and dispersed general leisure activities. Bureau lands also provide fish and wildlife habitat that is important for providing hunting and fishing opportunities on non-BLM lands.

Congress has recognized the national significance of the lower Salmon and Snake rivers as indicated by their status under the Wild and Scenic River Act (Pub. Law 90-542). The Snake River within the Hells Canyon National Recreation Area is a "component" of the National Wild and Scenic Rivers System. The lower Snake and Salmon rivers have been designated as "study" rivers under the Act.

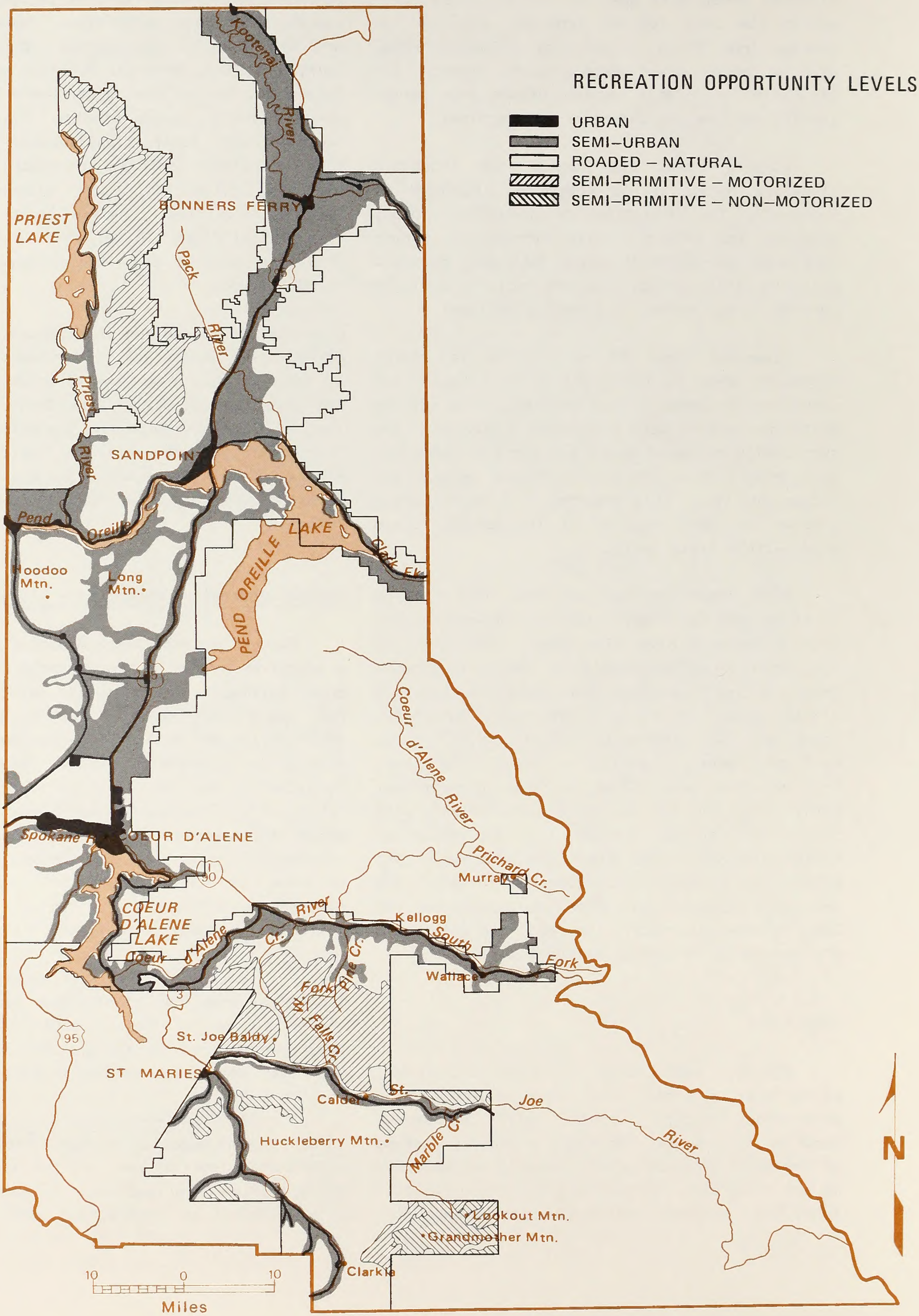
Outdoor Recreation Opportunity Classes

Recreation experience opportunities occur on a spectrum from primitive opportunities to urban opportunities. Utilizing the preliminary draft BLM Manual (BLM Manual 8320) for guidance, the district was delineated into homogeneous units by recreation opportunity class. This information is shown on Maps 3-14 and 3-15 and tabulated on Table 3-11. The four criteria used to delineate areas into one of six opportunity classes include remoteness, size of an area, irreversible evidence of man's activities, and renewable resource modification. The six classes are listed and defined as follows:

1. Primitive (P): Opportunity for isolation from the sights and sounds of man. Oppor- tunity to feel a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills.

2. Semi-Primitive Non-Motorized (SPNM): Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural

COEUR D'ALENE DISTRICT MAP
NORTH HALF

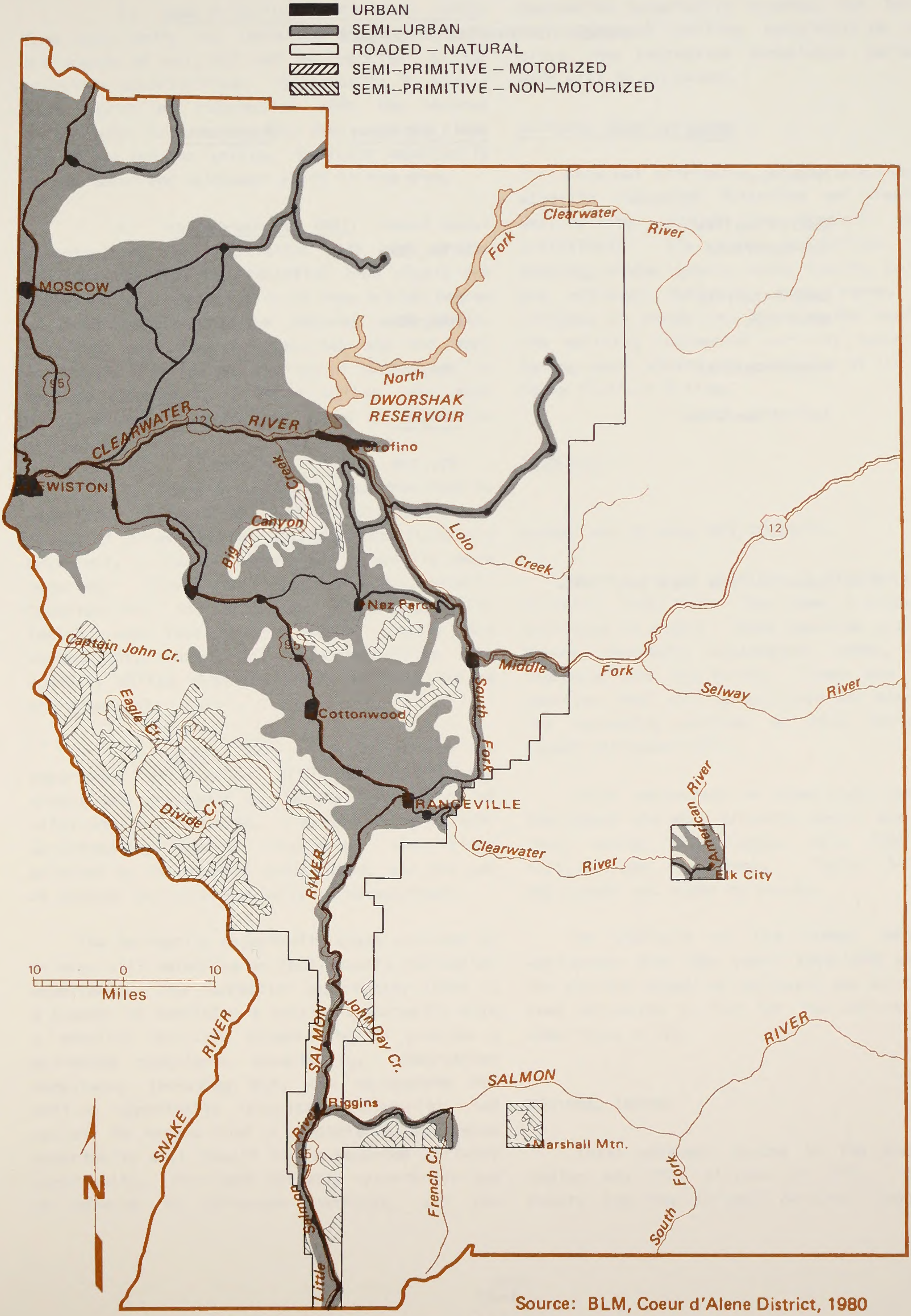


Source: BLM, Coeur d'Alene District, 1980.

MAP 3–14

COEUR D'ALENE DISTRICT MAP
SOUTH HALF

RECREATION OPPORTUNITY LEVELS



Source: BLM, Coeur d'Alene District, 1980

MAP 3–15

TABLE 3-11

RECREATION OPPORTUNITY CLASSES

Class	BLM Land Acres	% of Total
Primitive	0	0
Semi-Primitive Non-Motorized	64,739	24
Semi-Primitive Motorized	57,781	21
Roaded-Natural	118,231	44
Semi-Urban/Urban	30,624	11
	271,375	100

SOURCE: BLM, Coeur d'Alene District, 1980.

environment, to have moderate challenge and risk, and to use outdoor skills.

3. Semi-Primitive Motorized (SPM): Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills. Explicit opportunity to use motorized equipment while in the area.

4. Roaded-Natural (RN): About equal opportunities for affiliation with user groups and opportunities for isolation from sights and sounds of man. Opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities are not very important. Practice and testing of outdoor skills may be important. Opportunities for both motorized and non-motorized forms of recreation are possible.

5. Semi-Urban (SU): Opportunities to experience affiliation with individuals and groups at sites with convenience facilities are prevalent. These factors are generally more important than the physical environment. Opportunities for wildland challenges, risk taking, and testing of outdoor skills are unimportant, except for those activities like downhill skiing when challenge and risk taking are prevalent.

6. Urban (U): Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of sites and opportunities. Experiencing natural environments, having challenges and risks afforded by the natural environment, and the use of outdoor skills are relatively unimportant.

The recreation opportunity class provided by an area will determine an individual's recreation experience. The recreation opportunity class is a product of combining a setting opportunity with a specific activity opportunity to provide a preferred experience opportunity. Recreation suppliers, including BLM, can manipulate the setting opportunity (physical, managerial, and social) to assure that a predictable experience opportunity will result for a selected activity opportunity. The same activity opportunity can be offered in different settings, but the recreation experience in each setting will be different. For example, cross-country skiing (activity opportunity) can occur in all six recreation opportunity classes, but because of the different setting opportunities of each class, the recreation experience derived from each will be different.

Activity Opportunities

Physical attributes of the land, water, and wildlife resources determine an area's suitability to provide or support recreation activities. Six major activities (fishing, hunting, winter sports, water sports, collecting, and off-road vehicles) were rated. These ratings, in composite, describe the condition of the existing recreation activity opportunities. Rating score sheets are available at the Coeur d' Alene District Office.

ECONOMICS

LUMBER AND RELATED WOOD PRODUCTS

Of the eleven counties in the Coeur d'Alene District, BLM timber has been produced and/or processed in eight. These counties are Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Shoshone, and Nez Perce. These are the only counties that will be analyzed and discussed in the economics portion of this environmental impact statement (EIS).

Total employment in these eight counties in the lumber and wood products sector was 9,887 in 1978, while total wages were $163 million ($16,500 per employee). Table 3-12 shows employment and wages by county.

An analysis of the timber harvest and employment over the years 1969-1978 shows that the average number of employees per million board feet harvested is 7.4 for the entire EIS area (see Table 3-13).

REGIONAL INCOME

Total personal income in the eight-county region was $721 million in 1977. Nez Perce County had the largest personal income ($203 million) while Boundary County had the lowest ($26 million). Table 3-14 shows the personal income by county and by industry.

REGIONAL EMPLOYMENT

Total regional employment (eight counties) was 65,600 in 1977. The largest employer is the manufacturing industry (13,800 employees) followed by government and government enterprises (12,700 employees) and retail trade (9,600 employees). Table 3-15 shows employment by county and by industry.

TABLE 3-12

LUMBER AND WOOD PRODUCTS EMPLOYMENT AND WAGES [1]
1978

County	Employment	% of Total	Wages (Thousands)	% of Total	Wages per Employee
Benewah	878	9	$ 15,040.7	9	$ 17,131
Bonner	1,355	14	19,848.8	12	14,649
Boundary	551	5	8,341.9	5	15,140
Clearwater	1,649	17	27,169.6	17	16,476
Idaho	1,104	11	17,559.1	11	15,905
Kootenai	2,339	24	38,722.2	24	16,555
Nez Perce	1,777	18	33,514.3	20	18,860
Shoshone	234	2	3,092.3	2	13,215
Totals	9,887	100	163,288.9	100	16,516 (Average)

[1] Includes logging, sawmills, planing mills, veneer, plywood, pulp, and paper production.

SOURCE: Idaho Department of Employment
Annual Wages in Idaho, Calendar 1978
Average Monthly Employment in Idaho, Calendar 1978

TABLE 3-13

EMPLOYMENT AND PRODUCTION
(Lumber and Wood Products) EIS Area Totals
1969-1977

Year	Employment (Annual Average)	Production (MMBF)[1]	Employees Per MMBF
1969	9,218	1,345	6.85
1970	8,558	1,210	7.07
1971	8,841	1,265	6.99
1972	9,156	1,246	7.35
1973	9,903	1,184	8.36
1974	9,535	1,293	7.37
1975	9,109	1,231	7.40
1976	10,365	1,470	7.05
1977	10,499	1,346	7.80
1978	10,766	1,451	7.42
Average	9,595	1,304	7.37

[1] MMBF - Million Board Feet.

SOURCE: Idaho Department of Employment, Average Monthly Employment In Idaho, Calendar Years 1969-1977, and U. S. Forest Service, Missoula, Montana, 1979.

TABLE 3-14

Personal Income ($000's)
1977[1]

Industry	Benewah	Bonner	Boundary	Clearwater	Idaho	Kootenai	Nez Perce	Shoshone	Total
Total	32,166	70,639	26,115	50,235	57,040	179,365	203,084	102,096	720,740
Farm	2,123	2,294	2,055	1,646	7,184	2,943	7,392	84	25,721
Non-Farm	30,043	68,345	24,060	48,589	49,856	176,422	195,692	102,012	695,019
Private	25,266	57,307	18,075	38,991	38,171	143,761	173,348	89,130	584,049
Ag. Serv., For.[2]	(D)	(D)	54	891	323	635	(D)	(D)	---
Mining	299	(D)	0	-224[3]	(D)	-495[3]	(D)	37,510	---
Construction	1,171	7,981	1,783	1,732	4,907	18,117	15,670	7,854	59,215
Manufacturing	15,068	20,892	8,746	26,431	20,317	49,360	66,420	22,743	229,977
Non-Durable	87	525	125	(D)	275	2,330	23,361	682	---
Durable	14,981	20,367	8,621	(D)	20,042	47,030	43,059	22,061	---
Trans.,Publ.Util.	2,298	6,724	1,682	1,497	1,231	12,396	26,251	3,146	45,225
Wholesale Trade	483	1,246	834	782	(D)	7,195	13,416	2,327	---
Retail Trade	2,543	10,687	2,519	3,859	4,413	25,269	26,306	7,035	82,631
Fin., Inc., R. Est.	(D)	1,967	684	710	1,214	8,246	7,026	(D)	---
Services	2,793	7,473	1,773	3,313	3,978	23,038	27,207	6,228	75,803
Gov't. & Gov't. Ent.	4,777	11,038	5,985	9,593	11,685	32,661	22,344	12,882	110,965
Federal, Civilian	1,888	4,167	2,346	4,016	6,866	7,211	3,571	2,929	32,994
Federal, Military	115	387	102	182	227	882	539	346	2,780
State and Local	2,774	6,484	3,537	5,400	4,592	24,568	18,234	9,607	75,196

[1] Estimates based on 1972 standard industrial classification.

[2] Includes wage and salaries of U. S. residents working for international organizations.

[3] Negative income results from proprietors reporting losses in excess of wages and salaries paid.

(D) Not shown to avoid disclosure of confidential information. Data is included in totals.

SOURCE: Regional Economics Information System, Bureau of Economic Analysis, U. S. Department of Commerce, April 1979.

TABLE 3-15
REGIONAL EMPLOYMENT
1977[1]

Industry	Benewah	Bonner	Boundary	Clearwater	Idaho	Kootenai	Nez Perce	Shoshone	Total
Total Employment[2]	2,894	7,153	2,694	4,404	5,491	17,975	17,199	7,774	65,584
Number of Proprietors	573	1,377	565	557	1,278	2,539	1,605	521	9,015
Farm Proprietors	228	499	292	259	825	517	557	43	3,220
Non-Farm Proprietors	345	878	273	298	453	2,022	1,048	478	5,795
Total Wage and Salary	2,321	5,776	2,129	3,847	4,213	15,436	15,594	7,253	56,569
Farm	78	48	93	30	267	234	315	(L)	---
Non-Farm	2,243	5,728	2,036	3,817	3,946	15,202	15,279	7,248	55,499
Private	1,671	4,404	1,332	2,696	2,710	11,460	12,872	5,641	42,786
Ag. Serv.,For.[3]	(D)	(D)	(L)	75	(L)	51	(D)	(D)	---
Mining	14	(D)	0	0	(D)	(L)	(D)	2,088	---
Construction	40	382	91	100	148	796	748	319	2,624
Manufacturing	908	1,398	541	1,536	1,199	3,238	3,824	1,190	13,834
Non-Durable	16	61	19	(D)	32	199	1,364	48	---
Durable	892	1,337	522	(D)	1,167	3,039	2,460	1,142	---
Trans., Public Util.	109	337	94	109	75	759	914	175	2,572
Wholesale Trade	22	87	58	45	(D)	485	994	147	---
Retail Trade	278	1,241	315	458	513	3,038	2,946	805	9,595
Finance, Ins., Real Est.	(D)	157	57	61	99	553	582	(D)	---
Services	244	757	170	312	495	2,539	2,778	718	8,013
Gov't. and Gov't. Ent.	572	1,324	704	1,121	1,236	3,742	2,407	1,607	12,713
Federal, Civilian	125	296	177	307	531	507	230	237	2,410
Federal, Military	49	145	45	71	92	337	218	137	1,094
State and Local	398	883	482	743	613	2,898	1,959	1,233	9,209

[1] Estimates based on 1972 Standard Industrial Classification.

[2] Consists of wage and salary jobs plus number of proprietors.

[3] Includes number of jobs held by U. S. residents working for International organizations.

(D) Not shown to avoid disclosure of confidential information. Data is included in totals.

(L) Less than 10 wage and salary jobs.

SOURCE: Regional Economics Information System, Bureau of Economic Analysis, U. S. Department of Commerce, April 1979.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes and analyzes the probable environmental impacts of the alternatives including the proposed action. The analysis is designed to be commensurate with the expected magnitude, intensity, duration, and incidence of impacts. The organization of this chapter follows the outline of Chapter 3, Affected Environment.

For most resources, to avoid repetition, a full analysis of impacts appears only in the proposed action alternative, and brief summary descriptions of impacts are presented for the other alternatives. (A summary of impacts by resource component is presented in Table 2-2 in Chapter 2.) This chapter also portrays the relationship between the short-term use of man's environment and long-term productivity and identifies any irreversible or irretrievable commitments of resources involved in implementing the timber management program.

CLIMATE

Implementation of any of the alternatives would not affect the climate of northern Idaho. Some localized microclimates would be affected by proposed vegetative manipulation. With vegetation removal, soil temperature extremes would increase; relative humidity would decrease; and localized wind velocities could increase. These localized changes would primarily affect the understory. These effects would likely be insignificant.

AIR QUALITY

GENERAL IMPACTS

Impacts to air quality would primarily result from increased particulate emissions caused by slash burning and vehicular use of unpaved roads. Burning is usually of more concern since it is a localized and concentrated activity which produces a highly visible plume of particulates and water. High concentrations of particulates can impair human health and reduce visibility (FS 1976; EPA 1978). The general impacts of particulates on human health is known; however, little research has been done to correlate these impacts to prescribed burning activities (Sondberg et al. 1979).

PROPOSED ACTION ALTERNATIVE

The assumptions and methodology used to quantify the impacts of the alternatives including the proposed action are contained in Appendix 4-1. Table A of that appendix itemizes the potential air quality emission ranges that would result from burning activities by alternatives for particulates, carbon monoxide, hydrocarbons, nitrogen oxides, carbon dioxide, and water. Carbon dioxide and water vapor, not normally considered pollutants, make up over 90 percent of the effluent mass resulting from burning. Potential emissions resulting from BLM actions would be insignificant when compared to the totals developed in the Idaho Health and Welfare State Implementation Plan (SIP).

The air quality impacts due to particulate emissions are itemized in Table 4-1. The particulate estimates are presented by timber management activity categories and include the existing road systems impacts since most of the roads were developed and are maintained to manage forest lands. In examining the values, the BLM forestry program would have a relatively minor contribution. The range of particulate emissions is relatively close to a one percent share of the northern Idaho timber harvest. The prescribed fire values indicate higher proportions which may be due to less burning on privately harvested lands or to a low estimate by the Idaho Department of Health and Welfare source (IDHW).

With coordinated and dispersed burning activities the burning would have only short-term localized effects. Use of unpaved roads also causes localized dust effects during dry periods. Particulates would locally reduce visibility and

TABLE 4-1

PARTICULATE EMISSIONS FROM PRESCRIBED BURNING AND ROAD USE (TONS PER YEAR)

	Proposed Action	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
BLM Estimates						
Prescribed Fires						
Slash Burning	624	144	735	419	686	401
Site Preparation	82	19	97	2	90	55
Subtotal	706	163	832	421	776	456
Unpaved Roads	2,051	1,414	2,201	2,806	2,134	2,022
Total	2,757	1,577	3,033	3,227	2,910	2,478
IDHW Calculation Methods[1]						
Prescribed Fires	1,373	316	1,617	784	1,510	888
Unpaved Roads	2,088	1,519	2,222	2,762	2,162	2,062
Total	3,361	1,825	3,839	3,546	3,672	2,950

	Region 62 (52% of Forest Lands)			Region 63 (48% of Forest Lands)		
	Total	Fire	Roads	Total	Fire	Roads
Comparison by Region						
SIP Regional Values	389,924	14,965	180,644	1,004,810	29,476	410,491
Proposed Action:						
IDHW Method	1,748	714	1,086	1,613	541	1,002
Percent SIP	0.45%	4.77%	0.60%	0.16%	1.84%	0.24%
BLM Estimates	1,434	367	1,067	1,323	339	984
Percent SIP	0.37%	2.45%	0.59%	0.13%	1.15%	0.24%
Alternative Range (BLM Est.):						
Percent SIP	0.21-0.43%	0.57-2.8%	0.42-0.81%	0.08-0.15%	0.26-2.35%	0.17-0.33%

[1] Idaho Department of Health and Welfare (IDHW) Method presented for compatible State Implementation Plan (SIP) comparison.

SOURCE: BLM Calculations: IDHW 1980; Personal Communications with Kim Bothwell, IDHW, March 1980.

possibly aggravate chronic lung diseases. Although most of the affected areas are rural, residents and recreationists have come to expect high quality air in these areas. The burning activities would also have a beneficial impact by reducing fuel levels and fire hazards decreasing the potential for impacts to air quality due to wildfires.

OTHER ALTERNATIVES

Under alternative A (non-commodity emphasis) timber management activities are very limited; therefore, direct air quality impacts would be lowest of any of the alternatives. However, lower levels of management may result in increased wildfire potential and overall greater impacts to air quality.

Alternative B (commodity emphasis) would cause the highest levels of air quality impacts due to higher levels of timber management activity. Visibility regulations and potential impacts may constrain management of some proposed extensive forest management land in the Marshall Mountain Area due to nearby wilderness areas.

Alternative C (no-action) would basically continue the existing situation; however, particulate emissions from unpaved roads would be higher than those resulting from the proposed action alternative since fewer roads would be closed.

The short-term production increases of alternative D would cause higher levels of particulate emissions due to increased slash and site preparation burning and increased road use for log hauling.

Transferring prime timber lands to the State of Idaho under alternative E would reduce harvest levels but would probably result in a more scattered land ownership pattern requiring an expanded road system. Particulate emissions would be near or slightly higher than the existing situation.

SOILS

INTRODUCTION

In identifying the impacts to the soils resource, the 3-year sample sale and development plans were analyzed. The results of this analysis were then expanded to a 10-year period. Primary impacts to the soils resource are categorized as soil loss and soil compaction which affect soil productivity. Tables 4-2 and 4-3 summarize the impacts. These impacts are discussed in the following sections.

Nutrients would be lost from the forest ecosystem as a result of timber harvesting, thinning, and slash burning. Amounts of lost nutrients would be small in terms of the total amount of nutrients in the forest ecosystem (Sopper 1975). Therefore, site productivity would not be reduced significantly by nutrient losses and will not be discussed further. Soil loss and compaction are discussed in the following sections.

PROPOSED ACTION ALTERNATIVE

Road Construction and Maintenance

Of the actions proposed, road construction and maintenance would be the major cause of erosion and subsequent stream siltation.

An estimated 38 miles of new mainline road construction, 70 miles of reconstruction/improvement, and 123 miles of temporary road construction would take place over the 10-year period on an estimated 745 acres of relatively undisturbed lands. The estimated erosion rate for undisturbed land in the Coeur d'Alene District is .033 tons per acre per year (21 tons per square mile per year). Construction of logging roads would increase erosion 220 times (Megahan 1972) to 7 tons per acre per year (about 28 tons per mile of road). This rate would diminish to the approximate rate for undisturbed land in 4 years. Erosion due to road construction would total approximately 13,038 tons over the decade. Mass wasting is not a problem within the district as indicated by past experience.

Impacts to the soils resource from road construction and maintenance would not be significant with implementation of the proposed action alternative.

TABLE 4-2

TONS SOIL LOSS OVER 10-YEAR PERIOD BY ACTIVITY

	Proposed Action	Alt.A	Alt.B	Alt.C	Alt.D	Alt. E
Road Construction and Maintenance	13,038	3,065	15,315	10,940	14,245	9,450
Yarding-						
Ground based	315	72	370	312	341	232
Cable	130	30	155	46	145	61
Slash Disposal	260	60	307	114	287	165
Burning	24	3	28	16	26	15
Total	13,767	3,230	16,175	11,428	15,044	9,923

SOURCE: BLM, Coeur d'Alene District 1980

TABLE 4-3

SOIL DISTURBANCE AND COMPACTION ATTRIBUTABLE TO YARDING (ACRES)

	Proposed Action	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Acres Yarded-						
Ground based	7,792	1,792	9,194	7,833	8,570	5,809
Cable	8,122	1,869	9,585	2,856	8,934	3,856
Total	15,914	3,661	18,779	10,689	17,504	9,665
Acres Disturbed-						
Ground based	2,350	540	2,760	2,350	2,570	1,745
Cable	975	225	1,150	343	1,072	465
Total	3,325	765	3,910	2,693	3,642	2,210
Acres Compacted-						
Ground based	780	180	920	785	857	580
Cable	250	56	290	86	268	116
Total	1,030	236	1,210	871	1,125	696

SOURCE: BLM, Coeur d'Alene District 1980

Yarding

Soil Loss

Yarding would increase erosion by disturbing the surface layers of soil. Rice et al. (1972) concluded that about 30 percent of an area would be disturbed by tractor yarding and about 12 percent by cable yarding. These percentages were used to compute acres of disturbance shown on Table 4-3. This amounts to 2,350 acres disturbed by tractor yarding and 975 acres by cable yarding.

Yarding increases surface erosion by .053 tons per acre the first year, .040 tons per acre the second year, .027 tons per acre the third year, and .013 tons per acre the fourth year. Following the fourth year, erosion rates would return to approximate preyarding levels. This means that during the first year erosion from tractor yarding would be 125 tons and cable yarding would be 52 tons. Four-year losses would total 315 tons for tractor yarding and 130 tons for cable yarding. These losses would result in minimal reductions in soil productivity (Megahan 1972).

Compaction

Compaction caused by yarding would change the soil structure of the well developed surface layers causing reduced soil productivity; however, it would not be a problem for skeletal subsoils. About 1,030 acres would be compacted. Compacted soils would be loosened to some degree by the process of frost heaving. It is estimated that the compacted soils would recover in a period of 10 to 20 years.

Yarding would not have a significant impact on soil productivity through employment of the proposed action alternative.

Slash Disposal

Erosion and recovery rates would be similar to those for yarding. An additional 260 tons of soil would be lost. Slash burning removes protective vegetation and litter, thereby increasing surface erosion. It could also cause a breakdown of surface soil structure and reduce organic matter content (EPA 1976 b). An estimated 5 to 8 percent of the area would be severely burned (Tarrant 1956; Dryness et al. 1957 Cited in EPA 1976 b). This would amount to 350 acres under the proposed action. Since burning would increase erosion by approximately one-half that of tractor yarding, about 24 additional tons of soil would be lost to erosion.

Slash disposal would not significantly affect soil productivity.

Planting

Planting tree seedlings would reduce long-term erosion losses and improve water infiltration in areas with poor vegetation cover (FS 1978). Tree seedlings would hold more soil moisture through the dry season (June through September) and, therefore, reduce dry raveling (movement of soil downslope). More root penetration on steep slopes would increase slope stability and reduce chances of mass failure (Burroughs et al. 1976).

Fertilization

The proposed action would apply 150 pounds to 300 pounds of nitrogen per acre primarily in the form of urea pellets. Over the 10-year period, 190 tons to 375 tons of nitrogen would be applied to 2,500 acres. Fertilization with nitrogen would impact soil productivity beneficially because nitrogen is not only the nutrient most susceptible to loss from the forest ecosystem, but is also most likely to limit maximum growth in the forest (Moore et al. 1974).

Increased nitrogen in the forest ecosystem would make the soils more acid, increase the rate of decomposition, and increase the solubility of organic matter. Little is known about the effect of nitrogen on the recycling rates of other nutrients in forest soils. An increase in the nitrogen content of the forest soil would increase the rate of growth of all plants in the ecosystem, including weeds, brush, microbes, and trees.

OTHER ALTERNATIVES

Alternatives A through E would have the same impacts as the proposed action alternative except for differing amounts of erosion, disturbance, and compaction as indicated in Tables 4-2 and 4-3. No significant adverse or beneficial impacts to the soil resource would occur through implementation of any of these alternatives.

IMPACTS TO WATER RESOURCES

INTRODUCTION

The primary impacts of the forest management program on water resources would be increased water yield due to vegetation manipulation and increased sediment yield (soil reaching a water channel) due to land disturbances. Increased sedimentation is of general concern because it results in highly visible turbidity. It also has adverse effects on fisheries and other resources. Other water quality impacts such as changes in nutrient and chemical constituents are caused by vegetation changes, burning, and introduction of fertilizers.

Water yield would increase from those lands disturbed by road construction, timber harvest, yarding, and slash disposal and would be reduced by scarification, fertilization, and planting. Water yield increases were determined using U.S. Forest Service procedures (FS 1975). These increases in water yield decrease exponentially with time, and the rates vary by habitat types. Moist areas with dense vegetation such as cedar habitats recover quicker than harsh, dry areas such as ponderosa pine habitats (FS 1975).

Increased sedimentation would result from road construction, yarding, slash disposal, and mechanical scarification. Other phases of the management plan would not appreciably increase sediment yield. The major sources of soil loss due to erosion are discussed in the soils section of this chapter. Roads have been found to be the major source of soil erosion and subsequent sedimentation. Their effects have been studied extensively (EPA 1975b; EPA 1976; Megahan 1975; Megahan and Kidd 1972; Haupt and Kidd 1965; Packer 1965; Packer and Haupt 1965; Haupt 1959b). Other timber management practices causing sedimentation have also been studied for this region (EPA 1976; Megahan and Molitor 1975; Megahan 1975, 1974, 1972; Packer 1966; Haupt 1965).

Soil reaching water systems is termed sediment yield. Bureau of Land Management (BLM) Manual section 7130, Soil Conservation Service (SCS) Guides (EPA 1975a), and local studies (Lee and Molnan 1979) reported sediment yield values ranging from 15 percent to 54 percent for drainages of one square mile area and 7 percent to 28 percent for drainages of 100 square miles. For this EIS, the values for one square mile (streams) and 100 square miles (rivers) are assumed to be 40 percent and 28 percent, respectively.

Road construction, timber harvest, yarding, site preparation, and slash disposal would affect the quality of runoff water through increased erosion and leaching of nutrients and chemicals from the exposed soils and plant residues (EPA 1976, Snyder et al. 1975, Stark 1979, Packer 1965). Burning of the plant residues would accelerate the introduction of nutrients and chemicals by changing the form of the residual material (Tiedemann et al. 1979; Snyder et al. 1975; Megahan and Molitor 1975). Fertilization could directly introduce nutrients and chemicals into water courses. Vegetation removal, especially along streams, could increase water temperatures, thereby affecting aquatic habitats (Brown 1969; Brown and Krygier 1967; EPA 1976).

PROPOSED ACTION ALTERNATIVE

The primary impacts of the proposed timber management program to water resources would be increases in water yield and sediment load. These impacts have been quantified in Table 4-4 for all alternatives. Changes in water yield would primarily result from soil compaction, removal of vegetation, and subsequent snowpack alterations. Water yield increases are localized with downstream impacts dependent upon the size of the affected area. These impacts can be both beneficial or detrimental. Increases in water yield could provide additional water for general use and power generation but can also cause additional scouring and sediment transport. Peak flows and flow duration changes are dependent upon factors including timber management project location and design.

TABLE 4-4

IMPACTS TO WATER RESOURCES

	Proposed Action	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Water Yield Increase[1]						
Estimated Increase (ac.ft/yr)	405	93	477	380	445	308
Equivalent Flow (cfs)	0.56	0.13	0.66	0.53	0.62	0.43
Sediment Yield Increase (Over 10-year period)						
Total Soil Loss (tons)	13,767	3,230	16,175	11,428	15,044	9,923
Reaching Streams (tons)[2]	5,500	1,300	6,500	4,600	6,000	4,000
Reaching Rivers (tons)[2]	3,900	900	4,500	3,200	4,200	2,800

[1] For comparison purposes, the estimated water yield from all District lands (271,425 acres) is 305,000 acre feet per year or equivalent flow of 422 cubic feet per second.

[2] As used in this table, computations were done assuming one square mile of watershed area for streams and 100 square miles for rivers.

NOTE: Table 3-5 identifies recent sediment yields of the Snake, Clearwater, and Kootenai rivers.

SOURCE: BLM, Coeur d'Alene District, 1980.

When water yield increases are compared to the estimated water yield from all the district land (305,000 acre feet per year or equivalent flows of 422 cubic feet per second), the increases would be insignificant under the proposed action alternative.

Sediment yield is highly variable and can be inversely related to the drainage area. Therefore, sediment impacts must be examined on a watershed basis, analyzing sediment sources, stream conditions, and water quality maintenance needs. For the proposed action alternative, sediment yield would be increased by road construction and maintenance; yarding; slash disposal; and site preparation. Sediment yield would be decreased by planting, revegetation of disturbed areas associated with road construction, stream buffering, and fertilization. The proposed buffer strips would be effective in filtering out most of the sediment before it reaches the stream during sheet flows. However, when water is channelized by dissected topography, rough surfaces, or roads, eroded material is carried through the buffer strips (Brown 1980).

Largest sediment yields would normally occur with the first large runoff event following a soil disturbing practice. Sediment yields increase as stream flows increase during the runoff event; however, sediment yields normally decrease faster than stream flows after the event. This means that suspended sediments would normally be transported long distances during large runoff events and do little damage in small streams. Sediment deposition would occur as flow velocities decrease such as in lower gradient streams and in lakes behind dams. Despite high sediment yields during the first year following a soil disturbing activity such as road construction, the increased yields drop off dramatically with time and in most cases, stabilize within 4 to 5 years (Megahan 1974 and 1975).

With the implementation of the proposed action alternative, impacts to water quality from increased sediment would be insignificant compared to overall existing sedimentation levels.

With increases of sedimentation, nutrients and chemical constituents associated with soil disturbance would also increase; however, the increases would normally be of short duration and insignificant in overall effect (EPA 1976). Stream temperatures could increase slightly (1° C or less) due to removal of vegetation. This is also deemed to be insignificant.

Fertilization would result in slight increases in nutrient levels, but they would not approach allowable water quality criteria limits.

OTHER ALTERNATIVES

With the exception of the exclusion of fertilization under alternative C, implementation of any alternative (A through E) would result in the same kinds of impacts as described under the proposed action; however, impact magnitude would vary with the level of timber management intensity as prescribed by the alternative chosen. See Table 4-4 for a comparison of impacts to water resources by alternative.

Since fertilizer would not be applied under alternative C, the impacts from its use would not be applicable. Implementation of any alternative would not result in significant impacts to water resources.

VEGETATION

PROPOSED ACTION ALTERNATIVE

Forest Communities

Road Construction and Maintenance

Road construction would eliminate biological productivity (including timber production) on 37.7 miles (137 acres) of newly constructed running surface. Road maintenance would sustain this condition. In addition, vegetation would be altered on 608 acres within the road construction area. This alteration would be caused by the destruction of existing vegetation and the subsequent replacement of early successional plants such as grasses and forbs.

New roads would provide additional opportunities for public access. In some instances, this could result in removal or damage of vegetative material through firewood harvest, unauthorized cedar removal, or off-road vehicle use. Additional access would improve capabilities for fire protection; insect and disease management; and other timber management activities.

Because of the limited road construction proposed, the impacts to vegetation would be insignificant.

Harvest/Cutting Practices

The removal of trees creates openings in the forest canopy, which allows more light to penetrate to lower forest strata. Timber harvesting initiates secondary plant succession similar to that caused by natural disturbances. Different cutting practices open the forest canopy to different degrees, thereby influencing the plant composition and duration of the plant communities differently.

Clearcutting. Clearcutting (593 acres) would completely remove the tree canopy layer and damage the understory through felling operations. The complete removal of the tree canopy layer creates an environment conducive to the development of light-loving seral species. These species would dominate the site until they no longer favorably compete with planted seedlings such as ponderosa pine, Douglas fir, and western larch for sunlight. Clearcutting would result in an even-aged stand of trees. Trees along the edges of clearcuts would be susceptible to uprooting by wind (windthrow). If not salvaged, this would provide a breeding ground for insects and fuel for wildfire.

Partial Cutting. Seed tree, shelterwood, individual tree selection, mortality salvage, and commercial thinning are types of partial cutting methods. During the decade, 9,430 acres are proposed for partial cutting

(Seed Tree and Shelterwood Cutting). Like clearcutting, seed tree and shelterwood cutting practices produce stands of even-aged trees. In addition, both these practices increase the possibility that wind would uproot remaining seed trees and trees left along edges of the cutting units. As with clearcutting, these trees, if not removed, would also provide breeding habitat for insects and fuel for wildfire. As opposed to clearcutting, these practices would remove the tree canopy layer in two operations. The residual vegetation would be subject to damage by both operations.

Seed tree cutting usually impacts vegetation in much the same manner as clearcutting. The trees left standing after logging are generally few in number but provide a better chance for natural regeneration and recovery than clearcutting.

Shelterwood cutting, by virtue of lessened canopy removal, allows the development of fewer light-loving seral species than does clearcutting. This would favor the growth of plants requiring a cool-moist site, including grand fir, cedar, and western hemlock.

(Individual Tree Selection). As the name implies, individual tree selection would remove individual mature trees scattered throughout a stand. In heavily stocked stands (grand fir, western hemlock, and western red cedar series), openings created by the removal of single trees would be so small that only shade-loving species would be perpetuated. Residual vegetation would be subject to damage by felling operations. In low density stands (ponderosa pine and Douglas fir series), this practice would encourage the growth of sun-tolerant species.

Since no large openings in the timber stand are created resulting from individual tree selection cutting, windthrow would not pose a problem. In contrast to the aforementioned cutting practices, individual tree selection would result in stands of mixed-aged trees.

Damage to residual vegetation would occur at approximately 20-year intervals with each cutting entry. This practice would involve approximately 243 acres with the implementation of the proposed action alternatives.

(Mortality Salvage). Mortality salvage operations would have negligible impacts on the vegetation resource.

(Commercial Thinning). Commercial thinning (5,608 acres proposed) also opens the forest canopy but to a lesser degree than clearcutting or shelterwood cutting. Although understory vegetative growth may be somewhat stimulated, canopy opening is not generally sufficient to allow development of early plant succession. Like individual tree selection, residual vegetation would be subject to damage from felling and yarding operations. Commercial thinning promotes accelerated rates of growth in uncut trees. This would result in an approximate 2 percent increase in harvest volume over unthinned stands at the end of a rotation.

Yarding

Ground-based yarding would damage or destroy vegetation on approximately 20 and 30 percent of the logged areas for shelterwood cutting and clearcutting, respectively. In contrast, cable yarding would cause less damage and destruction to forest floor vegetation than ground-based yarding since the logs are usually suspended at one end above the forest floor and a machine does not traverse the ground surface.

Ground-based yarding following clearcutting would bare approximately 26 percent of the logged area to mineral soil (EPA 1973, cited in BLM 1979). The Environmental Protection Agency (EPA 1973) reports that cable yarding in clearcut areas bared approximately 12 percent of the site to mineral soil.

Assuming that the regeneration cut of a shelterwood cutting system results in about 60 percent of the soil surface impacts of a clearcut, it is estimated that this practice would bare 16 percent of the logged area to mineral soil from ground-based yarding and 7 percent from cable yarding. For the final cut of the shelterwood system, it is assumed that soil surface impacts would be 40 percentof those anticipated for clearcutting. This would result in 10 percent of the logged area being bared to mineral soil due to ground-based yarding and 5 percent from cable yarding. In most cases, the areas bared during the final shelterwood cut would be the same ones exposed during the regeneration cut 10 years previous.

Yarding activities, especially ground-based, disturb forest litter and exposed bare mineral soil, creating a better seed bed for many coniferous species.

In ground-based yarding, compaction of soils occurs mainly in skid trails. Froelich (1978) found a 12 percent reduction in tree growth in trees immediately adjacent to highly compacted areas. Table 4-5 shows productivity loss due to soil compaction. With cable yarding, soil compaction occurs primarily at the landing site. With implementation of the proposed action alternative, 780 and 250 acres would be compacted by ground-based and cable yarding systems, respectively. Overall, compaction restricts root development and limits revegetation to only hardy pioneer species.

Slash Disposal

Slash disposal impacts to vegetation result from piling and burning operations. Piling would be accomplished by small tractors, cable yarding systems, boom cranes with grapples, or by hand and would involve 3,633 acres under the proposed action. Of these, only tractor piling would affect vegetation measurably. Some soil compaction would occur during the piling operations. Physical damage to plants would result from the action of the rippers mounted on the tractor blade. On the other hand, the rippers would loosen and aerate the soil, promoting a better growth environment.

Burning would destroy vegetation in the immediate area of the fire. Conifer and other plant seed would be destroyed or sterilized by the heat from the burning. Most grasses and some shrubs have growing points that are close to or below the ground surface and can survive all but the hottest fire and are able to quickly reoccupy the site. Burning would actually enhance the germination of some seeds such as lodgepole pine and redstem ceanothus. Burning would alter the structure of the original understory plant community. Following burning, a fire-induced plant community would establish itself.

Site Preparation

Site preparation would involve scarification and burning. Impacts to vegetation from burning

TABLE 4-5

CHANGES IN TIMBER PRODUCTIVITY (IN THOUSANDS OF CUBIC FEET)

Activity	Proposed Action	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Roads:						
Running Surface[1]	- 249	- 58	- 295	- 491	- 275	- 229
Adjacent Areas[2]	- 884	- 202	-1,028	- 637	- 973	- 630
Harvest/Cutting Practices	Reducing the average age would increase productivity in the long-term.					
Yarding (Compaction):[3]						
Ground Base	- 170	- 39	- 201	- 171	- 187	- 127
Cable	- 55	- 12	- 63	- 19	- 58	- 38
Slash Disposal	+ 569	+ 131	+ 672	+ 409	+ 626	+ 419
Site Preparation	+ 61	+ 14	+ 71	+ 2	+ 67	+ 42
Planting	+ 124	+ 29	+ 136	+ 54	+ 136	+ 84
Precommercial Thinning	+ 83	+ 19	+ 98	+ 30	+ 91	+ 59
Fertilization	+ 452	+ 104	+ 534	0	+ 498	+ 373

[1] Would occur as long as running surface is maintained.

[2] Some trees in adjacent areas would experience some growth increase due to elimination of competition in the roadway.

[3] Would last at least 20 years.

SOURCE: BLM, Coeur d'Alene District, 1980.

were discussed in the previous section. The main impact of scarification on vegetation would be to change the structure of the existing plant community. Scarification would remove woody shrubs and injure other plants in the herbaceous layer. With the implementation of the proposed action, 349 acres would be scarified.

Planting

Planting coniferous tree seedlings shortens the time required for an area to become reforested by increasing the competitive advantage of the planted species over the resident herbaceous vegetation. In natural regeneration, a good seed crop is produced at an average of once in 7 years for most tree species. Under the best possible site conditions, natural regeneration could occur in one year. Under artificial regeneration, seedlings are generally planted the first year following harvest. Because the planting stock is about 2 years old, it already has at least a one-year competitive advantage on good sites and an even greater advantage on poorer sites. Under the proposed action, 2,275 acres would be planted.

Precommercial and Sanitation Thinning

These practices would remove selected trees from the general level of the stand canopy, releasing the remaining trees from competition for light, moisture, and nutrients, thereby increasing the growth potential of remaining trees. Understory plants would be damaged during these operations. The change in available light, soil moisture relationships, and nutrient availability would change the structure of the original understory community. Under the proposed action alternative, 3,054 acres would be thinned.

Fertilization

The proposed action would apply 150 pounds to 300 pounds of nitrogen per acre in the form of pelletized urea to 2,488 acres. An increase in the nitrogen content of the forest soil would increase the rate of growth of all plants in the ecosystem, including weeds, brush, microbes, and trees (Moore et al. 1974, cited in BLM 1978).

Other Communities

Road Construction and Maintenance

Some damage would occur to riparian and aquatic vegetation due to stream crossings, bridge construction, and culvert placement. Due to the limited acreage involved and the small number of crossings anticipated (four on Class I streams), the impacts would be insignificant.

Sediment resulting from road construction would affect aquatic vegetation; however, due to the relatively small acreage involved and the proposed buffer guidelines, the impacts on aquatic plants are expected to be of low significance.

Operation Components

Buffer strip guidelines would protect riparian and aquatic vegetation from damage by other operation components.

Rare, Threatened, Endangered Plant Species

An examination of the sample 3-year timber sale plan indicates that no known rare, threatened, or endangered plant species' habitats would be affected by the proposed action alternative. There exists a potential for damage to unknown populations of these species. However, this potential is small due to reviews mandated by the proposed action.

OTHER ALTERNATIVES

With the exception of no fertilization occuring under alternative C, alternatives A through E would have all the same types of impacts as the proposed action alternative. However, impact magnitudes and intensities would vary with the alternative chosen. Refer to Chapter 2 for acreages to be treated by the various management practices. Table 4-5 compares impacts to timber productivity by alternatives. Table 4-6 shows impacts to vegetation by layer in acres. No significant impacts to vegetation would occur through implementation of any of the alternatives.

TABLE 4-6

CHANGES TO VEGETATION (BY LAYER) RESULTING FROM TIMBER MANAGEMENT ACTIVITIES

(- indicates loss or damage to vegetation in acres, + indicates a gain or improvement in acres)

Activity-Layer	Proposed Action	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Road Construction:						
Tree Canopy	- 745	- 171	- 879	- 708	- 820	- 559
Shrubs	- 745	- 171	- 879	- 708	- 820	- 559
Grasses - Forbs	+ 608	+ 139	+ 707	+ 438	+ 669	+ 433
Harvest/Cutting:						
Clearcut, Shelterwood, Seed Tree						
Tree Canopy	-6,361	-1,463	-7,507	-7,250	-6,997	-4,403
Shrubs	Harvest practices would have little immediate effect on shrubs, grasses, and forbs.					
Grasses - Forbs						
Comm. Thin, Ind. Tree Selection,						
Mortality Salvage:						
Tree Canopy	-1,682	- 407	-2,085	0	-1,944	-1,113
Shrubs	Harvest practices would have little immediate effect on shrubs, grasses, and forbs.					
Grasses - Forbs						
Yarding:						
Ground Based						
Tree Canopy	Few trees damaged by yarding operations.					
Shrubs	-1,295	- 297	-1,528	-1,391	-1,424	- 966
Grasses - Forbs	-1,295	- 297	-1,528	-1,391	-1,424	- 966
Cable						
Tree Canopy	Few trees damaged by yarding operations.					
Shrubs	- 574	- 132	- 677	- 235	- 631	- 274
Grasses - Forbs	- 574	- 132	- 677	- 235	- 631	- 274
Slash Disposal:						
Piling						
Tree Canopy	-------------------------------No effect-------------------------					
Shrubs	-1,963	- 452	-2,316	- 680	-2,160	-1,223
Grasses - Forbs	- 982	- 226	-1,158	- 340	-1,080	- 612
Burning						
Tree Canopy	Few trees damaged by burning operations.					
Shrubs	-1,705	- 91	-2,012	-1,654	-1,876	-1,116
Grasses - Forbs[1]	-1,705	- 91	-2,012	-1,654	-1,876	-1,116

TABLE 4-6 (Cont.)

CHANGES TO VEGETATION (BY LAYERS) RESULTING FROM TIMBER MANAGEMENT ACTIVITIES

Activity-Layer	Proposed Action	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Site Preparation:						
Scarification						
Tree Canopy	No effect					
Shrubs	- 314	- 72	- 371	- 9	- 346	- 255
Grasses - Forbs	- 157	- 36	- 186	- 5	- 173	- 128
Burning						
Tree Canopy	No effect					
Shrubs	- 877	- 202	-1,035	- 27	- 965	- 586
Grasses - Forbs[1]	- 877	- 202	-1,035	- 27	- 965	- 586
Planting:						
Tree Canopy[2]	+2,275	+ 523	+2,684	+ 984	+2,502	+1,531
Shrubs	No effect					
Grasses - Forbs	No effect					
Precommercial and Sanitation Thinning:						
Tree Canopy[3]	-1,222	- 281	-1,442	- 222	-1,344	-1,044
Shrubs	-1,222	- 281	-1,442	- 222	-1,344	-1,044
Grasses - Forbs	No effect					
Fertilization:						
Tree Canopy Shrubs Grasses - Forbs	Increased rate of growth for all plants except for alternative C, under which there is no fertilization prescribed.					

[1] Approximately 90 percent of grasses would recover one year following burn.

[2] Newly planted trees.

[3] Remaining trees would experience increased growth due to less competition for water, light, and nutrients.

SOURCE: BLM, Coeur d'Alene District, 1980.

Under alternative C, no fertilizers are prescribed. None of the impacts identified for this practice in the proposed action alternative would occur.

ANIMALS

TERRESTRIAL

Proposed Action Alternative

Timber sales and forest development procedures are made up of numerous separate actions each of which affects some aspect of terrestrial animal habitat. Actions were analyzed for each species or group of species determined to be significant in Chapter 3. Appendix 4-2, Table A lists the actions; the effect of the action in the particular species' or species groups' habitat; the nature and length of the impact; the significance of the impact; and comments.

Endangered, Threatened, and Sensitive Species

Of the endangered and threatened species occurring in north Idaho, none would be affected by the proposed timber management plan. Of the 17 sensitive species in the Coeur d'Alene District, only the bobcat is known to occur on areas where sales would occur. Several others such as the fisher, lynx, bureal chickadee, wolverine, and pygmy shrew may occur. Because of the scattered distribution and limited information as to occurrence, analysis of impacts on these species will be done on a case-by-case site specific basis in future environmental assessments. However, no significant adverse or beneficial impacts from the proposed action have been identified.

Big Game

The 3-year timber sale plan was analyzed to assess the impacts on habitat for the following big game animals: elk, white-tailed deer, mule deer, and black bear. The results of this analysis are summarized in Appendix 4-2, Table A.

Roads would essentially destroy big game habitat, and road use would decrease habitat quality through disturbance. Timber harvest would increase forage and decrease cover. Generally, there are no significant beneficial or adverse impacts anticipated from the proposed action.

The major impact of timber harvest on moose habitat for the proposed action would be the increased opportunity of illegal harvest provided by improved access into areas frequented by moose. The effect of increased road access from the proposed action is not known but is estimated to be very small since most roads would avoid important moose areas or would be buffered.

Timber harvest methods would have little effect on moose since clearcut sizes and buffer guidelines would maintain moose habitat. Proposed slash disposal methods and forest development practices would have little or no effect on moose habitat.

Upland Game

Blue and ruffed grouse constitute the affected upland game species. Riparian areas are protected by wetland-riparian protection guidelines and streamside buffers. There would be increases and decreases in forage and cover from various actions as a result of the proposed action; however, no significant impacts would occur during the 10-year period. Appendix 4-2, Table A gives a more complete analysis of the impacts to grouse.

Riparian Habitat Dependent Species

The riparian habitat component would be only slightly impacted by the proposed action. Vegetation would be maintained in accordance with the basic buffer guidelines, and road construction would be limited in accordance to the road guidelines. Roads noise and timber sale activities may disturb animals using the habitat for the duration of an active sale.

Animals Dependent on Snags

Timber harvest, slash disposal, and forest development methods would have little effect on the habitat of snag dependent animals. An average of two snags per acre (14 inches diameter at breast height [DBH] or greater) would be maintained. Where snag densities are below desired levels, diseased and/or unmerchantable trees will be killed or left to provide snags. This should provide sufficient feeding and nesting habitat for all snag using species (Thomas, ed. 1979).

Timber harvest activities may remove some snags that are currently used for nesting and feeding. Although clearcutting would remove snags, the small number and small size of clearcuts planned for the decade would have little impact on overall snag habitat. Road construction removes snags. Firewood demand is increasing and increased access of open roads will increase firewood harvest opportunity, thus decreasing snags along these roads. The analysis of firewood harvest is on a worst case basis assuming total removal of desirable snags from new open roads constructed in the decade. None of these activities would, however, significantly impact snag habitat.

Animals Dependent on Mature and Old-Growth Timber

The removal of mature and old-growth timber from lands proposed for timber management would not be significant within the decade span of this statement. However, continuation of proposed management on those lands would mean essentially the complete removal of all mature and old-growth dependent animals' habitat within 100 years on lands identified for timber management. The number of acres that would be lost to these animals on the timber management lands is not known at this time.

High Interest Species and Species Occupying Unique Habitats

No high interest or unique species' habitat would be significantly altered by the proposed action. Raptor nesting areas would be buffered and raptor prey would increase as forest diversity and forage increases. The wet-area habitat of the northern bog lemming would be protected by wetland-riparian protection guidelines and streamside buffers. Pika habitat, talus, or rockslides would be affected only by the construction of roads. No sales in the 3-year sample plan proposed new road construction on rockslides; therefore, very little road construction would occur in this unique habitat.

Other Alternatives

With the exception of impacts to mature and old-growth dependent species in alternative D, the impacts of other alternatives would be similar to those discussed under the proposed action. The accelerated old-growth harvest prescribed under alternative D would eliminate some habitat in less time than under any other alternative. However, since timber harvest is not proposed for all old-growth stands, all habitat would not be eliminated.

AQUATIC

Introduction

Sample 3-year timber sale and development plans were analyzed. Data from those plans were used to represent the types and intensity of impacts for a 10-year plan under the proposal and various alternatives.

The impacts of the alternatives including the proposed action fall into the broad categories of 1) altered stream flow regimes, 2) change in water temperatures, 3) logging debris accumulation in the streams, 4) increased accumulation of bottom and suspended sediments, and 5) fertilization.

It is difficult to generalize about the impacts of the proposed action on fish and even more difficult to quantify them. In his study of carrying capacity for juvenile salmonids in northern California, Burns (1971, cited in BLM 1979) stated, "Even with 3 years of prelogging study, it would be difficult to attribute a change in carrying capacity under 50 percent to anything but natural variation."

Table 4-7 summarizes the most important impacts to anadromous and resident coldwater game fish habitats. Analysis of the 3-year sample plans indicates no impact on habitat for warmwater or coolwater fish. Therefore, Table 4-7 does not address habitat for these species. The white

TABLE 4-7
IMPACT SUMMARY FOR COLD WATER RESIDENT AND ANADROMOUS GAME FISH

			Alternatives						
Component	Measure	Proposed Action	A	B	C	D	E	Significance	Comments
Loss of fish habitat caused by new crossings on Class I streams	Feet	160	40	200	160	200	120	Low	Due to road guidelines, these crossings would not be migration barriers. In addition, 100 feet of down-stream fish habitat would temporarily be affected.
Loss of aquatic habitat caused by new crossings on Class II streams	Feet	3400	800	4000	3160	4000	2680	Low	Class II streams have minor to no fish habitat value.

SOURCE: BLM, Coeur d'Alene District, 1980.

sturgeon (classified as sensitive) would not be adversely impacted by any of the alternatives.

Proposed Action Alternative

Altered Stream Flow Regimes

Data from the water resources section shows a water yield increase over present condition of .56 cubic feet per second, which is not significant to aquatic animals. Scouring of a channel bottom would decrease fish habitat and food sources. Localized scouring may occur in some headwater streams but is not expected to be significant to fish habitat in the total context.

Change in Water Temperatures

Erman et al. (1977) indicated that when streams were buffered by strips of standing timber at least 30 meters wide on each side, the population of macroinvertebrates such as stone fly or caddis fly larva did not vary measurably from those of unlogged drainages. Slight changes in water temperature anticipated (1° C or less) would not normally impact aquatic species.

Logging Debris Accumulation

The stream buffer policy would reduce the amount of debris accumulation in streams over present levels. Logging debris and jams in moderate amounts may be beneficial by providing escape cover and feeding stations; however, large amounts of debris form check dams that fill with silt causing loss of food-producing rubble and gravel (Chapman 1962). Large quantities of debris can also form migration barriers. No significant beneficial or adverse impacts from logging debris accumulation are anticipated from the proposed action alternative.

Sediment Changes

Fine sediment delivered to fish habitat is detrimental regardless of the source. Sources of sediment by management practice are contained in the Soils Section, Table 4-2. Both suspended and bottom sediments adversely impact fish. Prolonged exposure to high concentrations of suspended sediment would cause abrasion, thickening, and fusion of the gills. Bottom sediments can create adverse impacts by 1) suffocating fish embryos, 2) reducing the capacity of rearing areas (pools) by covering or filling them with sand, 3) decreasing the growth and/or density of fish by reducing the abundance of aquatic insects, and 4) loss of other fish habitat (Bjornn et al. 1977).

The construction of stream crossings in fish habitat areas would cause considerable and dramatic effects for a short period of time within 100 feet of the crossing. However, according to Erman et al. (1977), it is the repeated failure of the crossings, not their construction, which significantly disrupts stream biota.

As a result of timber harvest, sediment production would be increased in certain areas. Streamside buffers and upstream settling of sediment would reduce the actual amount delivered to fish habitat in major streams and rivers. Some small headwater streams would suffer heavy increases in sediment. The sediment would be diluted in the larger streams. In addition, due to the relatively small acreage involved with BLM timber (1.9% of EIS area land total), the impact of sediments on fish habitat is not expected to be significant.

Fertilization

Fertilization would not have a significant impact on fish habitat. Mitigating factors such as those found in the buffer guidelines would minimize the potential for spillage or accidental spraying of water courses.

Other Alternatives

With the exception of no fertilization under alternative C, the implementation of alternatives A through E would have the same kinds of impacts as the proposed action with varying degrees of magnitude of those impacts due to variations in timber management intensities. Since fertilization is not proposed in alternative C, there would be no associated impacts. No significant impacts are anticipated from implementation of any of these alternatives.

CULTURAL RESOURCES

INTRODUCTION

Because of the nonrenewable nature of cultural resources, impacts to this resource are regarded as permanent. Adverse impacts to cultural resources, outlined in the Code of Federal Regulations (36 CFR 800, Protection of Historic and Cultural Properties), are as follows: 1) destruction or alteration of all or part of a property; 2) isolation from or alteration of the property's surrounding environment; 3) introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting; 4) neglect of a property resulting in its deterioration or destruction; and 5) transfer or sale of a property without adequate conditions or restrictions regarding preservation, maintenance, or use.

The quantification of the magnitude of impacts to cultural resources is not possible. (Wildesen [1978a and 1978b] has discussed the problem with impact assessment of archaeological resource management and timber harvest.) Impacts to cultural resources will vary depending upon the site. If a site is primarily confined to surface deposits, any surface disturbance could destroy the entire site, but if a site consists of subsurface deposits, severe surface disturbance may have a negligible effect upon the site. Even with the employment of management guidelines, the potential exists for possible impacts from the alternatives.

PROPOSED ACTION ALTERNATIVE

No adverse impacts to listed or eligible National Register properties would result from the proposed action; however, unidentified cultural resources could be affected by the various operation components of the proposed action. Accurate estimates of the number of cultural resources that may be affected cannot be made from the data presently available.

Ground disturbing activities resulting from the proposed actions (road construction, yarding methods, and site preparation) could damage cultural resources. The horizontal and vertical relationships of artifacts and features could be disrupted; structures and sites, both surface and subsurface, could be damaged to varying degrees depending upon the extent of the site; and prehistoric and historic artifacts could be broken and chipped making analysis of the artifacts difficult. Ground disturbance would also increase the chance of erosion and expose sites to vandalism.

Burning could contaminate Carbon 14 dating samples making them unreliable for future use and could alter pollen samples decreasing the possibility of developing paleoecological models. Burning could also damage or destroy structures and combustible artifacts and alter lithic materials.

During and after timber management practices, the potential for disturbance to cultural resources would be increased due to increased activities in these areas. Activities such as road construction would increase public access opportunities to these areas after timber harvest has been completed increasing the possibility of vandalism.

OTHER ALTERNATIVES

The potential for damage to unidentified cultural resource sites would be proportionate to the proposed levels of timber management activities for any alternative. The same would be true for potential impacts to listed or eligible National Register properties.

VISUAL RESOURCES

Timber management practices modify landform and change vegetation. The affected area visually contrasts with the landscape character of the remaining portions of the viewshed, thus causing a primary impact on the entire viewshed. Most often the action constitutes a visual intrusion as opposed to a visual improvement. Virtually all timber management practices impact visual resources by creating evidence of human presence and by disturbing previously undisturbed areas. Landform modifications are considered permanent changes although their impact is lessened over time as additional vegetative screening is reestablished. Vegetation modifications are not generally permanent but can cause long-term impacts.

During the Management Framework Plan (MFP) Step 2 tentative land allocation process (located at the Coeur d'Alene District Office), conflicts between the timber and visual resources were resolved by restricting timber management activities in some cases or changing the visual resource management (VRM) class in others. The potential for significant visual impacts exists when classes are lowered due to proposed timber management activities. Table 4-8 itemizes proposed VRM class reductions for each alternative.

Recommended VRM Class I lands are not changed by any of the alternatives. This class is applied to the identified roadless areas and the Snake and Salmon river lands withdrawn under the Wild and Scenic Rivers Act. Roadless areas are given wilderness protection during the inventory and study process which the VRM Class I designation partially provides. The river areas are not commercial forest lands so timber production was not considered for them, and the Class I recommendations did not conflict with timber production proposals.

Most of the class reductions necessitated due to the alternatives affected recommended Class II lands. Although certain operations components such as thinning and fertilization are possible, road construction and the common harvest methods, clearcutting, and two-stage shelterwood systems cumulatively would exceed Class II constraints at least during the project's early life (2 to 10 years) and for that reason are not proposed in Class II areas.

Both intensive and extensive timber management practices can be designed to meet Class III and IV contrast constraints. The primary difference is that operation components in Class III areas will require more careful design especially concerning road construction, cutting practices, and yarding methods.

LAND USES

GRAZING

Proposed Action Alternative

The Coeur d'Alene District has approximately 65,366 acres of timbered lands leased for livestock grazing. Only a few allotments would be involved in a timber sale or regeneration project in any given year. Impacts from these treatments would be minimal on a district-wide basis, although from the viewpoint of an affected lessee, these impacts might be considerable. District Management Framework Plan (MFP) guidelines discourage livestock use on timber harvest areas until after restocking has been achieved, which may require the lessee to secure alternative livestock pasture.

TABLE 4-8

PROPOSED VRM CLASS CHANGES (IN ACRES)

		Alternatives					
Class	Current Situation	Proposed Action	A	B	C	D	E
Class I	57,206						
+		0	0	0	0	0	0
-		-4,348	0	-6,076	-4,348	-4,348	-4,348
Net Change[1] Class		-4,348	0	-6,076	-4,348	-4,348	-4,348
Total		52,858	57,206	51,130	52,858	52,858	52,858
Class II	122,297						
+		+4,301	0	+5,979	+4,301	+4,301	+4,301
-		-71,570	0	-91,319	-71,570	-71,570	-71,570
Net Change Class		-67,269	0	-85,340	-67,269	-67,269	-67,269
Total		55,028	122,297	36,957	55,028	55,028	55,028
Class III	40,389						
+		+63,365	0	+68,439	+63,365	+63,365	+63,365
-		-7,575	0	-10,087	-7,575	-7,575	-9,593
Net Change Class		+55,790	0	+58,352	+55,790	+55,790	53,772
Total		96,179	40,389	98,741	96,179	96,179	88,462
Class IV	51,533						
+		+15,827	0	+33,064	+15,827	+15,827	+14,850
-		0	0	0	0	0	0
Net Change Class		+15,827	0	+33,064	+15,827	+15,827	+14,850
Total		67,360	51,533	84,597	67,360	67,360	66,383
TOTAL	271,425	271,425	271,425	271,425	271,425	271,425	262,731

[1] Not attributable to timber production

SOURCE: BLM, Coeur d' Alene District, 1980

Timber types with a canopy cover of over 60 percent are considered unsuitable for livestock grazing. Timber harvest could convert the resident vegetation to productive forage by opening dense canopy cover and stimulating increased growth of the grasses, forbs, and shrubs.

Timber harvest activities such as falling and skidding of logs would temporarily remove vegetation and allow noxious weeds such as Canada thistle (Cirsium arvense) to become established in the harvest areas reducing forage quality. Inadequate slash disposal may reduce livestock access to forage and increase the possibility of leg injury to foraging animals. Skid trails and timber harvest roads could, however, improve livestock utilization of an area by serving as stock trails although steep road cutbanks could result in barriers to livestock movement and a subsequent hazard to both animals and motorists. Seeding skid trails, landings, and roadbanks with grass and clover species would increase livestock forage.

Post harvest activities such as scarification and planting would result in a short-term (5 to 15 years) decrease in forage production. Burning would increase production of forage for the same term. In the long-term, timber management activities, by design, would favor tree growth over other vegetation, including livestock forage. Areas being reforested may be fenced to protect the seedlings from animal damage and would consequently be lost to grazing until restocking is accomplished.

Alternative A

Under alternative A, less timber would be harvested than in the proposed action resulting in a decrease in the amount of unsuitable range (canopy greater than 60 percent) that would be converted to suitable range for livestock. Other impacts to grazing discussed in the proposed action impact section would be expected to occur in proportionately varying degrees.

Alternative B

The implementation of alternative B would result in the same impacts as alternative A except that an increase in forage would result from conversion of more unsuitable range to suitable range compared to the proposed action alternative.

Alternative C

Impacts to livestock grazing under alternative C would continue in the same manner and degree as they are occurring at present.

Alternative D

Alternative D would have the same impacts as alternative B.

Alternative E

Under alternative E, impacts of the same character as the proposed action alternative to livestock grazing would occur but would be less in magnitude proportionate to the decrease in the productive forest land base.

RECREATION

Bureau of Land Management (BLM) timber management practices modify the natural resources of the environment. This directly affects both recreation setting opportunities and activity opportunities, thereby indirectly affecting recreation experience opportunities.

Outdoor Recreation Opportunity Classes

The outdoor recreation opportunity class of an area is largely determined by the physical setting factors of remoteness, size, and evidences of man. Modification of the setting in excess of the prescribed limits would change the affected areas opportunity class, necessitating a change in recreation management objectives.

During the MFP Step 2 tentative land allocation process, conflicts between timber management and recreation opportunities were resolved by restricting timber management activities in some cases or by changing recreation opportunity classes in others. Table 4-9 summarizes these changes.

TABLE 4-9

RECREATION OPPORTUNITY CLASS CHANGES (IN ACRES)

		Alternatives					
Class	Current Situation	Proposed Action	A	B	C	D	E
Semi-Primitive Non Motorized	64,739						
+		0	0	0	0	0	0
-		-17,470	-4,888	-25,733	-17,470	-17,470	-18,568
Net change Class		-17,470	-4,888	-25,733	-17,470	-17,470	-18,568
Total		47,269	59,851	39,006	47,269	47,269	46,171
Semi-Primitive Motorized	57,781						
+		+255	0	0	+255	+255	+255
-		-25,400	-1,862	-32,387	-25,400	-25,400	-25,400
Net change Class		-25,145	-1,862	-32,387	-25,145	-25,145	-25,145
Total		32,636	55,919	25,394	32,636	32,636	32,636
Roaded Natural	118,281						
+		42,615	+6,750	+58,120	+42,615	+42,615	+42,585
-		-416	-35	0	-416	-416	-7,892
Net change Class		+42,199	+6,715	+58,120	+42,199	+42,199	+34,693
Total		160,480	124,996	176,401	160,480	169,480	152,974
Urban & Semi-urban	30,624						
+		+416	+35	0	+416	+416	+416
-		0	0	0	0	0	-90
Net change Class		+416	+35	0	+416	+416	+326
Total		31,040	30,659	30,624	31,040	31,040	30,950
TOTAL	271,425	271,425	271,425	271,425	271,425	271,425	262,731

Note: Only timber related changes are shown in this table.

SOURCE: BLM, Coeur d'Alene District, 1980

These recreation opportunity class changes have not yet been determined significant or insignificant or even beneficial or adverse. Needed existing and projected recreation opportunity class demand information is not available in order to make these determinations.

The BLM manages only 2 percent of the land base of the EIS study area. Any changes made on this small of a land base can be deemed insignificant in a regional context. The major recreation suppliers can make up for any changes caused by the BLM if they result in shortages.

Activity Opportunities

Changes in the physical setting (land, water, wildlife, etc.) affect the quality of recreation activity an area can support or provide. Ratings of activity opportunity quality were made considering changes resulting from implementation of the alternatives. When these were compared to the existing ratings, no changes were identified.

ECONOMICS

PROPOSED ACTION ALTERNATIVE

Economic impacts of the proposed action and alternatives discussed in the following text are summarized in a comparative format in Table 4-10.

Lumber and Related Wood Products

The proposed action would increase the annual timber harvest by 2.77 million board feet. This would increase employment in the lumber and related wood products industry by 21 jobs in the eight-county region. This would be an increase of .2 percent above the current level. Total annual wages in this industry would increase by $338,000 (an increase of .2 percent).

Regional Income

The direct changes occurring in the lumber industry would cause secondary impacts in all sectors of the regional economy. This secondary change has been estimated through the use of the Dynamic Regional Analysis Model (DYRAM). This is a computer model developed by BLM which calculates secondary income and employment changes resulting from the initial change (Dickerman 1975).

The initial income gain in the lumber industry would cause an additional (or secondary) gain of $238,000 throughout the regional economy. The major gains would be in the lumber and wood products industry ($68,000); transportation and communications ($34,000); and wholesale and retail trade ($38,000).

The total annual income change (direct and secondary) would then be an increase of $576,000 which is .08 percent of the 1977 eight-county regional income.

Regional Employment

The secondary employment changes would total an increase of 21 jobs. Due to the wide geographical dispersion of the region, it is anticipated that these would take the form of part-time jobs or overtime performed by existing employees. Total employment gains (direct and secondary) would be 43 jobs which would be a region-wide increase of .06 percent.

ALTERNATIVE A

Lumber and Related Wood Products

Alternative A would reduce the annual timber harvest by 8.05 million board feet. This would reduce employment in the lumber and related wood products industry by 60 jobs, which is .6 percent of the current level. Total annual wages would decrease by $983,000 (.6 percent).

Regional Income

The secondary income change would be a loss of $695,000 throughout all sectors of the eight-county regional economy. The major impacts would be felt by the lumber and wood products industry (-$129,000); transportation and communications (-$96,000); wholesale and retail trade

TABLE 4-10

ECONOMIC IMPACTS COMPARISONS FOR DECADE

Component/Process/Index and Attributes	Units	Proposed Action	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Context (Of Extremes Only)
Change In Volume Harvested	MMBF	+2.77	-8.05	+5.33	0	+4.18	-2.10	
Lumber and Wood Products Direct Employment	Jobs	+ 21	- 60	+ 39	No Change	+ 31	- 16	
Secondary Employment	Jobs	+ 21	- 62	+ 41	No Change	+ 28	- 14	
Total Regional Employment (Direct and Secondary)	Jobs	+ 42	- 122	+ 80	No Change	+ 59	- 30	-122 Jobs (Alt. A) = 2/10 of 1% of total regional employment. +80 Jobs (Alt. B) = 1/10 of 1% of total regional employment.
Lumber and Wood Products Direct Income	Dollars in thousands	+ 338	- 983	+ 651	No Change	+510	- 256	
Secondary Income	Dollars in thousands	+ 238	- 695	+ 457	No Change	+359	- 180	
Total Regional Income (Direct and Secondary)	Dollars in thousands	+ 576	-1,678	+ 1,108	No Change	886	- 436	-$1,678 (Alt. A) = 2/10 of 1% of total regional income. +$1,108 (Alt. B) = 2/10 of 1% 1% of total regional income.

SOURCE: BLM, Coeur d'Alene District, 1980.

(-$93,000); services (-$73,000); and other manufacturing (-$53,000). The total annual income change (direct and secondary) would then be approximately -$1.7 million, or .2 percent of the total regional income.

Regional Employment

The secondary employment change would be a loss of 62 jobs. The major industries impacted would be the same as identified in the regional income section. Many of the jobs lost would be from limited part-time jobs or jobs reduced from full-time to part-time. Total employment losses (direct and secondary) would be 122 jobs, or .2 percent of the total regional employment.

ALTERNATIVE B

Lumber and Related Wood Products

Alternative B would increase the annual timber harvest by 5.23 million board feet. This would increase employment in the lumber and related wood products industry by 39 jobs in the eight-county region. This would be an increase of .4 percent above the current level. Total annual wages in this industry would increase by $651,000 (an increase of .4 percent).

Regional Income

The secondary income change would be an additional gain of $457,000 annually. This gain would be spread through all sectors of the regional economy with the major gains being experienced in the lumber and wood products industry ($132,000); transportation and communication ($65,000); and wholesale and retail trade ($74,000). The total annual income change would be a gain of $1.1 million, or .2 percent of the regional income.

Regional Employment

The secondary employment changes would be a gain of an additional 41 jobs. The major industries making these gains would be the same as those identified in the regional income section. Many of these jobs would be part-time jobs or overtime performed by existing employees. Total employment gains would be 80 jobs (direct and secondary), or .1 percent of the total regional employment.

ALTERNATIVE C

Alternative C would have no impact on the economy of the region.

ALTERNATIVE D

Lumber and Related Wood Products

Alternative D would increase the annual timber harvest by 4.18 million board feet. This would increase employement in the lumber and related wood products industry by 31 jobs in the eight-county region, which would be an increase of .3 percent above the current level. Total annual wages in this industry would increase by $510,000 (an increase of .3 percent).

Regional Income

The secondary income change would be an additional gain of $359,000 annually. This would be spread through all sectors of the economy with the major gains being experienced in the lumber and wood products industry ($91,000); wholesale and retail trade ($55,000); and transportation and communications ($61,000). The total annual income change would be a gain of $886,000 (direct and secondary), or .1 percent of the regional income.

Regional Employment

The secondary employment changes would be a gain of an additional 28 jobs. The major industries making these gains would be the same as those identified in the regional income section. Many of these jobs would take the form of part-time jobs or overtime performed by existing employees. Total employment gains would be 59 jobs (direct and secondary), or .09 percent of the total regional employment.

ALTERNATIVE E

The Alternative E analysis is based on a reduction in productive forest lands managed by the BLM through the transfer to the State of Idaho of lieu selection lands. This would result in a reduction of the BLM's contribution to the economy.

Lumber and Related Wood Products

Alternative E would reduce the annual timber harvest by 2.10 million board feet. This would reduce employment in the lumber and wood products industry by 16 jobs, or a decrease of .2 percent from the current level. Total annual wages would decrease by $256,000 (.2 percent).

Regional Income

The secondary income change would be a loss of $180,000 throughout all sectors of the regional income. The major losses would be felt by the lumber and wood products industry (-$46,000); transportation and communications (-$31,000); and wholesale and retail trade (-$27,000). The total annual income change (direct and secondary) would be approximately -$436,000, or .06 percent of the total regional income.

Regional Employment

The secondary employment change would be a loss of 14 additional jobs. The major industries impacted would be the same as identified in the regional income section. Most of these losses would take be from eliminated part-time jobs or jobs reduced from full-time to part-time. Total employment losses (direct and secondary) would be 30 jobs, or .04 percent of the total regional employment.

ENERGY

Implementation of any alternative would be considered an intensive energy investment because of the types and amounts of equipment involved. Table 4-11 shows the energy investments in British thermal units (Btu) for the alternatives. It is assummed that all energy consumed would be in the form of fossil fuels.

PROPOSED ACTION ALTERNATIVE

Implementing the proposed action alternative would invest 1,300,400,000 Btus of energy. If the energy was expended as gasoline it would equal 1,045,000 gallons. This investment would constitute an irretrievable commitment of energy.

OTHER ALTERNATIVES

Implementing any other alternative would result in the same kinds of impacts; however, the energy expended would vary with the alternative chosen. Table 4-11 compares the energy investments for the various alternatives.

RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY AND THE IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Table 4-12 summarizes the relationship between the short-term use of the environment and long-term productivity. As used in the table, "short-term" is defined as the 10-year period assessed in this document, and "long-term" is the period of time during which impacts from an alternative may still be measured.

Also summarized in the table are irreversible and/or irretrievable commitments of resources. For this analysis, "irreversible" describes any action, impact, or use which is not capable of being reversed. "Irretrievable" means not replaceable or recoverable.

TABLE 4-11

ENERGY INVESTMENT IN MILLIONS OF BRITISH THERMAL UNITS (1,000,000 BTUs)

Activity	Proposed Action	Alternatives A	B	C	D	E
Road Construction	245.2	68.2	348.8	331.5	324.0	223.2
Logging[1]	984.4	226.3	1,163.8	718.3	1,186.7	744.7
Site Preparation						
Burn in Place	3.4	0.8	3.9	0.1	3.7	2.2
Scarification	3.3	0.7	3.8	0.1	3.6	2.6
Planting	11.2	2.6	13.2	4.9	12.3	7.5
Precommercial Thinning	4.6	1.0	5.4	1.7	5.0	3.2
Fertilization	48.3	11.1	57.0	0	53.1	40.0
TOTAL	1,300.4	310.4	1,595.9	1,056.6	1,588.4	1,023.4

[1] Logging includes all timber harvest activities beginning with cutting and ending with the logs arriving at the mill.

SOURCE: BLM Coeur d'Alene District, 1980. Based on data supplied by Department of Energy, Region X Staff.

TABLE 4-12

RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY AND THE IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Alternative	Short-term Use	Long-term Productivity[1]	Irreversible	Irretrievable
Proposed Action	Optimize the balanced use of resources.	Increase wood fiber productivity. Maintain wildlife habitat. Slight decrease in visual quality. Increase motorized recreation opportunities. Slight decrease in livestock forage.	None	Loss of 3,900 tons of soil which would reach rivers in the form of fine sediments. Potential destruction of cultural sites. Potential destruction of threatened/endangered plants. Investment of 1,300.4 million Btus of energy.
Alt. A Non-commodity emphasis	Optimize protection and enhancement of natural environment.	Decrease wood fiber productivity. Slight decrease, wildlife habitat. Maintain visual quality. Maintain non-motorized recreation opportunity. Decrease livestock forage.	None	Loss of 900 tons of soil. Potential destruction of cultural sites. Potential destruction of threatened/endangered plants. Investment of 310.4 million Btus of energy.
Alt. B Commodity emphasis	Emphasize production of timber.	Increase wood fiber productivity. Decrease wildlife habitat. Decrease visual quality. Increase motorized recreation opportunities. Decrease livestock forage.	None	Loss of 4,500 tons of soil. Potential destruction of cultural sites. Potential destruction of threatened/endangered plants. Investment of 1,599.3 million Btus of energy.
Alt. C No-Action	Maintain status quo.	Maintain wood fiber productivity. Maintain wildlife habitat.Decrease visual quality. Increase motorized recreation opportunities. Maintain livestock forage.	None	Loss of 3,200 tons of soil. Potential destruction of cultural sites. Potential destruction of threatened/endangered plants. Investment of 1,056.6 million Btus of energy.
Alt. D Accelerated harvest of overmature timber	Emphasize timber production for short-term followed by balanced use thereafter.	Same as proposed action.	None	Loss of 4,200 tons of soil. Potential destruction of cultural sites. Potential destruction of threatened/endangered plants. Investment of 1,588.4 million Btus of energy.
Alt. E Transfer of state lieu lands	Balanced use of resources on lands still under BLM Administration.	Same as proposed action.	None	Loss of 2,800 tons of soil. Potential destruction of cultural sites. Potential destruction of threatened/endangered plants. Investment of 1,023.4 million Btus of energy.

[1] As compared to present situation or trend.

SOURCE: BLM, Coeur d'Alene District, 1980.

CHAPTER 5

CONSULTATION AND COORDINATION

CHAPTER 5
CONSULTATION AND COORDINATION

PREPARERS

Individuals of the Bureau of Land Management (BLM) directly involved in preparing this Environmental Impact Statement (EIS) are listed in Table 5-1.

COORDINATION PRIOR TO THE EIS PREPARATION

Prior to the preparation of this EIS, the Coeur d'Alene District conducted extensive consultation and coordination with its publics during the Unit Resource Analysis (URA) and Management Framework Plan (MFP) process. These earlier portions of the resource management decision-making process were widely advertised in an effort to reach the affected publics and establish involved and informed public contacts.

As a part of this effort, public planning workshops were held during April and May 1979 and again in January 1980. At the April-May workshops, the public was asked to identify significant problems and issues to be addressed during the planning process. During the January 1980 workshops, the BLM discussed and received public comments on the district's tentative management proposals. For the most part, the alternatives including the proposed action of this EIS came directly from the tentative management proposals.

CONSULTATION AND COORDINATION DURING THE PREPARATION OF THE EIS

With the previous public involvement effort as a foundation, the Coeur d'Alene District continued its consultation and coordination during the preparation of this EIS. In February 1980, approximately 650 letters were sent to a wide variety of interest groups, agencies, and individuals. The letter discussed the EIS and the timber management proposals and solicited comments, suggestions, and opinions concerning issues to be discussed and analyzed in this EIS. In addition, news releases were issued asking anyone with information pertinent to the EIS to contact the BLM.

The public as well as BLM employees were encouraged to continue ongoing communication concerning this EIS throughout its development. A complete record of public involvement activities, correspondence, and results is located in the Public Participation Plan Record Document on file at the Coeur d'Alene District Office.

COORDINATION IN THE REVIEW OF THE EIS

The BLM will request comments on the EIS from the agencies and interest groups listed in Table 5-2. A complete listing of individuals as well as other groups and agencies who will receive copies of the EIS is located in the EIS mailing list at the Coeur d'Alene District Office.

TABLE 5-1
LIST OF PREPARERS

Name	EIS Responsibility	Education	Experience
Ted Graf	Team Leader	B. S. Public Administration	3 years BLM, Natural Resource Specialist; 2 years BLM, Writer-Editor; 1 year Private Industry, EIS Technical Coordinator.
Dave Murray	Technical Coordinator	B. S. Range Management	3 years BLM, Environmental Coordinator; 6 years BLM, Natural Resource Specialist; 4 years BLM, Range Conservationist;
Kris Long	Writer-Editor	B. A. Journalistic Communications	11/2 years BLM, Public Affiars; 11/2 years BLM, Writer-Editor.
Dick Prather	Forestry	B. S. Forestry	3 years BLM, Supervisory Forester; 6 years BLM, Forester.
Gus Vitolins	Vegetation	M. F. Forestry	15 years BLM, Staff Forester; 8 years BLM, Forester.
Brent Frazier	Wildlife	M. S. Biology	3 years BLM, Wildlife Biologist.
Lew Brown	Fisheries	B. S. Wildlife Habitat Management	7 years BLM, Wildlife Biologist.
Tom Rinkes	Range Managment	B. S. Wildlife Biology	11/2 year BLM, Range Consevationist.
Vern Webb	Soils	B. S. Agriculture (Soil Science)	13 years BLM, Soil Scientist; 14 years SCS, Soil Scientist.
David Fortier	Water Resources	M. S. Civil Engineering (Water Resource Planning), B. S. Civil Engineering	1 year BLM, Hydrologist; 1 year Ada/Canyon 208 Areawide Planning Group; 4 years postgraduate water resources work at the University of Idaho; Research Associate.
Dave Sisson	Cultural Resources	B. S. Anthropology	11/2 years BLM, Archaeologist.
Terry Kincaid	Recreation and Visual Resources	B. S. Park and Recreation; Resources Administration	6 years BLM, Outdoor Recreation Planner.
Scott Forssell	Roadless/Wilderness Resources	M. S. Natural Resource Administration; B. S. Park Administration	4 years BLM, Outdoor Recreation Planner.
Paul Card	Social Factors	Baccalaurette in Sociology and Math	1 year BLM, Sociologist; 2 years Executive Office of the Governor (Idaho); 5 years Idaho Dept. of Transportation.
Stan Frazier	Economic Factors	B. S. Agricultural Economics	5 years BLM, Economist.

TABLE 5-2

AGENCIES AND INTEREST GROUPS AND INDIVIDUALS WHO WILL RECEIVE COPIES OF THE EIS

FEDERAL AGENCIES

- National Advisory Council on Historic Preservation
- Department of Agriculture
  - Forest Service
  - Soil Conservation Service
  - Agricultural Stabilization and Conservation Service
- Department of the Interior
  - Bonneville Power Administration
  - Bureau of Indian Affairs
  - Bureau of Mines
  - Bureau of Reclamation
  - Heritage Conservation and Recreation Services
  - National Park Service
  - U. S. Fish and Wildlife Service
  - U. S. Geological Survey
- Enviromental Protection Agency

ELECTED OFFICIALS, FEDERAL

- Senator Frank Church
- Senator James McClure
- Representative Steven Symms

ELECTED OFFICIALS, STATE

- Governor John V. Evans
- Senator Kermit Kiebert
- Senator Norma Dobler
- Senator Art Manley
- Senator Mike P. Mitchell
- Senator C. Chase
- Senator Dorothy McCann
- Senator Claud Judd
- Representative Marion Davidson
- Representative Don Maynard
- Representative Thomas Snyder
- Representative Tom Boyd
- Representative Robert Hosach
- Repsesentative Gary Ingram
- Representative L. Spurgeon
- Representative Louis Howath Jr.
- Representative Joe Wagner
- Representative Emery Hedlung
- Representative B. E. (Bud) Lewis
- Representative Carl Braun
- Representative Lester Clemm

TABLE 5-2 (Cont.)

AGENCIES AND INTEREST GROUPS AND INDIVIDUALS
WHO WILL RECEIVE COPIES OF THE EIS

STATE AGENCIES

- Idaho Department of Health & Welfare
- Idaho Department of Environmental & Community Services
- Idaho Department of Commerce & Development
- Idaho Department of Fish & Game
- Idaho Farm Bureau
- Idaho State Planning & Community Affairs Agency
- Idaho Department of Public Lands
- Idaho Highway Department
- Idaho Department of Parks & Recreation
- Idaho Transportation Department
- Idaho Bureau of Mines and Geology
- Idaho State Clearing House
- State Historic Preservation Officer
- Idaho Department of Water Resources

LOCAL GOVERNMENT

- Adams County Commissioners
- Benewah County Commissioners
- Bonner County Commissioners
- Boundary County Commissioners
- Clearwater County Commissioners
- Idaho County Commissioners
- Kootenai County Commissioners
- Latah County Commissioners
- Lewis County Commissioners
- Nez Perce County Commissioners
- Shoshone County Commissioners
- County Extension Agents
- County Planning Commissioners
- Panhandle Planning & Development Council

OTHER ORGANIZATIONS

- BLM Coeur d' Alene District Advisory Council
- Ada County Fish and Game League
- California Trout
- Montana Wilderness Association
- Northwest Environmental Defense Center
- North Idaho Forestry Association
- Idaho Forest Industries Council
- National Forest Products Association
- Society of American Foresters
- Western Forest Industries Association

TABLE 5-2 (Cont.)

AGENCIES AND INTEREST GROUPS AND INDIVIDUALS WHO WILL RECEIVE COPIES OF THE EIS

Timber Products Bureau
American Forest Institute
Inland Forest Resource Council
Western Forestry & Conservation Association
Idaho Gem Club
Idaho Mining Association
North Idaho Mineral Club
Northwest Mining Association
Idaho Wildlife Federation
Palouse Audubon Society
Lewis-Clark Wildlife Club
Wildlife Resources Incorporated
The Idaho Chapter of the Wildlife Society
Northwestern University, Center for Urban Affairs
Wildlife Management Institute
Natural Resources Defense Council, Inc.
Idaho Environmental Council
Kootenai Environmental Alliance
Natural Resource Committee
Sierra Club
The Nature Conservancy
Idaho Conservation League
Friends of the Earth
Agricultural Stabilization & Conservation Committee
Idaho Outfitters and Guides License Board
Kootenai County Saddle Club
Outdoors Unlimited, Inc.
Winter Ridgers, Inc.
Northwest Power Boaters Association
Western Whitewater Association
Elk Unlimited
Idaho Trails Council, Inc.
Idaho State Historical Society
Nez Perce Tribal Executive Council
Anthropology Club
Idaho Archeological Society
Clearwater County Historical Society
Executive Director, Advisory Council on Historic Presevation
Idaho County Historical Society
Bonner County Historical Society & Museum
Pacific Northwest Indian Center
Idaho Water Resources Research Insititute
American Rivers Conservation Council
The Wilderness Society

TABLE 5-2 (Cont.)

AGENCIES AND INTEREST GROUPS AND INDIVIDUALS WHO WILL RECEIVE COPIES OF THE EIS

Governor's Wilderness Advisory Committee
Idaho State Grange
Idaho County Cattleman
Idaho Cattleman's Association
North Idaho Chamber of Commerce
Shoshone County Board of Realtors
American Association of University Women
Avery Citizens Committee
Idaho League of Women Voters
Hoo Hoo Club
Greater Snake River Land Use Congress
Business and Professional Women

INTERESTED INDIVIDUALS

Copies of this EIS are available for public inspection at the following locations:

Bureau of Land Management
Washington Office of Public Affairs
18th and C Street, N. W.
Washington D. C. 20240
Phone: (202) 343-4151

Bureau of Land Management
Idaho State Office
P. O. Box 042
Boise, Idaho 83724

Bureau of Land Management
Coeur d'Alene District Office
P. O. Box 1889
Coeur d' Alene, Idaho 83814

Bureau of Land Management
Cottonwood Area Office
Route 3
Cottonwood, Idaho 83522

APPENDIX

APPENDIX 2-1
SAMPLE 3-YEAR TIMBER SALE PLAN

Year-Sale	Location[1] T. R. Sec.	Volume MMBF	Miles of Road New[2]	Improved	Closed[3]	Harvest Method-Acres	Yarding Method-Acres	Slash Disposal Method-Acres
1-1	47N,2E, 5,6	1.0	1.0	.5	1.5	CT-260	T-45,C-215	T-35,G-20,LS-210
1-2	59N,1W, 18	.5	1.05	.5	.8	R-65	T-59,C-6	T-42,G-3,LS-20
1-3	48N,4E, 21,22,23	3.0	1.2	6.2	14.4	CC-10,R-207,F-30	T-143,C-104	T-133,C-104,G-5,B-10
1-4	49N,3W, 15	.5	.2	.5	.7	R-28,M/S-12	T-7,C-33	T-7,H-4,C-21,LS-8
1-5	61N,2E, 2 62N,2E, 23,26,27, 34,35	3.0	4.4	2.2	4.4	CC-20,R-527, CT-130	T-504,C-173	T-394,C-133,G-35, B-20,LS-130
1-6	29N,2W, 4 30N,2W, 19,20, 29,33	6.5	5.0	1.0	---	R-410	T-220,C-190	T-38,LS-372
Year 1 Totals		14.5	12.85	10.9	21.8	CT-390,R-1237, F-30,CC-30,M/S-12	T-978,C-721	T-649,C-258,H-4, G-63,B-30,LS-740
2-1	56N,2W, 7,8	1.0	3.8	.6	---	CC-18,R-128	T-45,C-101	T-45,C-83,B-18
2-2	44N,3E, 1,2	5.0	2.0	2.0	4.0	CC-60,R-217, CT-120,ITS-73	T-275,C-195	T-112,C-105,G-32, B-60,LS-193
2-3	46N,1W, 12 46N,1E, 7,8	2.0	5.5	.7	6.2	CT-396	T-80,C-316	T-50,G-44,LS-330
2-4	34N,5E, 17,20, 21,22	2.0	2.0	---	---	R-120	T-75,C-45	T-18,LS-102
2-5	35N,3E, 23	1.0	.5	2.0	---	R-80	T-30,C-50	T-5,LS-75
2-6	29N,8E, 29,30, 31,32	4.0	5.0	---	---	CT-120,ITS-100, CC-70,R-140,F-170	T-320,C-180	T-40,B-70,LS-390
Year 2 Totals		15.0	18.8	5.3	10.2	ITS-173,CT-636 CC-148,R-685,F-170	T-825,C-887	T-270,C-188,G-346, B-148,LS-1090
3-1	62N,3E, 10	1.0	.8	1.6	3.1	R-55,F-53,CT-34	T-91,C-51	T-79,C-24,G-4,H-5
3-2	46N,1E, 4,8,9	3.0	1.75	1.5	1.0	R-147,CT-135	T-100,C-182	T-48,C-30,G-22,L-195
3-3	48N,5E, 31,32	3.0	7.0	1.0	---	CT-375	T-72,C-303	C-140,G-56,LS-235
3-4	55N,2W, 9	.5	2.0	.7	2.7	CT-114	T-79,C-35	G-22,LS-114
3-5	26N,2E, 4,5,8,9	4.0	1.0	---	---	R-155	T-75,C-80	T-20,LS-135
3-6	26N,2E,25,35	2.0	4.0	---	---	R-200	T-70,C-130	T-20,LS-180
3-7	29N,8E, 35	.3	.6	---	---	CT-50	T-50	LS-50
Year 3 Totals		13.8	17.15	4.8	6.8	R-557,F-53, CT-708	T-537,C-781	T-167,C-194,H-5, G-104,LS-909

[1] Locations are noted on map at back of EIS.
[2] Includes temporary spur roads.
[3] To be closed following harvest activities.

CC = Clearcut
R = Regeneration Cut
F = Final Cut
CT = Commercial Thin
ITS = Individual Tree Selection
M/S = Mortality Salvage

T = Tractor or Cat
C = Cable

T = Tractor or Cat
C = Cable
H = Hand
G = Grapple
B = Burn in Place
LS = Lop and Scatter

SOURCE: BLM, Coeur d'Alene District, 1980

APPENDIX 2-2
SAMPLE 3-YEAR FOREST DEVELOPMENT PLAN

Year-[1] Number	Location[2] T., R., Sec.	Site Prep. Method-Acres	Planting Acres	Precommercial Thin (Acres)	Fertilize Acres
4-1	48N,1W, 24	HB-20	20	---	---
4-2	48N,4E, 22	---	10	---	---
4-3	48N,3E, 11	---	---	60	---
4-4	48N,1W, 27	---	25	25	---
4-5	48N,1W, 35	---	---	110	---
4-6	47N,2E, 5,6	---	---	---	260
4-7	61N,2E, 2 62N,2E, 35	---	20	---	130
4-8	21N,1E, 10,15	M-55, B-65	---	---	---
4-9	35N,2E, 24	---	---	40	---
4-10	26N,2E, 31,32	---	---	142	---
Year 4 Totals		HB-20,M-55, B-65	75	377	390
5-1	47N,1E, 24	HB-160	160	---	---
5-2	48N,1W, 12	---	28	---	---
5-3	56N,2W, 7	---	40	---	---
5-4	44N,3E, 1,2,3, 12	HB-45	105	80	120
5-5	46N,1W, 12 46N,1E, 7,8	---	---	---	326
5-6	53N,5W, 28	---	---	40	---
5-7	21N,1E, 10,15	---	120	---	---
5-8	22N,1E, 3	---	---	30	---
5-9	21N,1E, 11,12	---	---	160	---
5-10	26N,2E, 31,32 35N,2E, 24	---	---	---	222
Year 5 Totals		HB-205	453	310	668
6-1	48N,5E, 31,32	HB-95	95	---	---
6-2	56N,2E, 21,28	MB-10	10	30	---
6-3	62N,3E, 10	HB-10,MB-40	50	---	---
6-4	46N,1W, 8,9	---	---	---	135
6-5	55N,2W, 9	---	---	60	114
6-6	21N,1E, 1,2	---	---	50	---
6-7	21N,1E, 13,14	---	---	160	---
6-8	21N,1E, 11,12 22N,1E, 3	---	---	---	190
Year 6 Totals		HB-105,MB-50	155	300	439

[1] Forest development usually starts about three years after the sale.

[2] Locations are noted on map at rear of EIS.

HB = Hand Pile and Burn
MB = Machine Pile and Burn
M = Machine Scarity
B = Burn

SOURCE: BLM, Coeur d' Alene District, 1980

APPENDIX 2-3
ELK HABITAT COORDINATING REQUIREMENTS

Early in 1976, wildlife biologists in northern Idaho representing the Idaho Fish and Game Department, U. S. Forest Service, Bureau of Land Management, and the University of Idaho began development of a procedure for coordination of silvicultural activities with elk habitat needs similar to that developed by Black, Scherzinger, and Thomas (1976) for the Blue Mountains of Oregon and Washington, but adapted to the habitat needs of Rocky Mountain elk in northern Idaho. In July 1977, a 3-day meeting of these biologists was held at the Idaho Panhandle National Forests Supervisor's Office in Coeur d'Alene, Idaho. Guidelines were developed at this meeting, utilizing research data from literature reviews, personal communication with elk research biologists, and discussions between participants. The resulting guidelines contained the best information available on the effects, relationships, and coordination of silvicultural practices and elk habitat management for the northern Idaho forests. These guidelines would, of necessity, be updated and modified as additional data becomes available.

The objective of these guidelines is to provide forest land managers in northern Idaho a means by which to assess and evaluate the effects of silvicultural prescriptions, timber harvest techniques, and other land management decisions on Rocky Mountain elk and their habitat. It is not meant to provide all the answers for optimization of elk habitat but rather to display cause and effect relationships and to provide alternatives for consideration in land use decision making.

Within the guidelines are definitions of terms used to describe elk habitat, some of which are in the glossary, and descriptions of seasonal habitat requirements of elk. Following is the body of the guidelines listing points of concern of timber harvest methods; slash disposal methods, etc.; research findings on the points specified; and recommendations for each point of concern.

RECOMMENDATIONS FOR COORDINATING LOGGING WITH ELK HABITAT REQUIREMENTS

TIMBER HARVEST

General

The action of removing coniferous vegetation from a given area by logging procedures has the effect of altering the balance between cover and forage areas and disrupting movements and distribution. Since the forage:cover ratio is used to describe optimum elk habitat, forest managers must understand that the balance between these two entities by habitat type will govern the level of possible use of the area by elk. Utilizing the broad forage:cover ratio concept put forth for the Blue Mountains by Black et al. (1976), these recommendations adapt that concept to northern Idaho and go one step further by providing forage:cover ratios by habitat types.

Silvicultural Methods

Point of Concern

The method of timber harvest selected for a given area will determine the resultant forage produced within the capability of the site. It then follows that the utilization of the various harvest methods with regard to size, degree, and arrangement of the cut will govern the expected elk use after the logging action.

Research Findings

Irwin (1976) reported that the method of harvest will influence the resultant forb and shrub production on the harvest areas, with clearcut sites producing the most palatable forage and partial cuts the least.

Allen et al. (1976) recommend small openings "...but cutting units as large as 100 acres may be acceptable in some circumstances." A management plan for elk on the Flathead National Forest indicates no clearcut to be over 35 acres in size (Baglien and Biggins, 1976). Hershey and Leege (1976) found 80 percent of all elk groups (122 observations) to use portions of clearcut within 46 meters (150 feet) of the timbered edge. They further indicate that elk were more apt to use portions of clearcuts farther from the edge if "...scattered clumps of trees remained standing within the logged area."

Lyon (1976) analyzed pellet group distributions and found heavier elk use in openings in the 10 to 40 acre range, especially if slash was adequately disposed of. In southwestern Oregon, Harper (1969) found elk use of openings to decrease sharply at distances greater than 300 yards from the edge.

Reynolds (1962, 1966) found that forage sites created by harvesting timber have decreased elk use at distances beyond 600 feet from the edge of cover. Utilizing the foregoing research, Black et al. (1976) specified that in order to qualify under optimum habitat arrangements, no forage area should be wider than 1,200 feet.

Associated with the size, type, and shape of cut are the leave areas which will remain undisturbed until the vegetation of adjacent cutover areas qualifies as hiding cover. Black et al. (1976) stated that the optimum size for thermal cover units on summer and spring-fall range is 30 to 60 acres.

Reynolds (1966) found that elk used the area that extended 137 meters (450 feet) into the forest from the forest edge. With this information, Black et al. (1976) prescribed hiding cover patches of between 800 and 1,600 feet in width.

Recommendations

(Variations from literature have been made to adapt to the northern Idaho situation.)

- Any silvicultural method which changes the description of an area from cover to forage, according to our definition, should be confined to an area with a width of from 800 to 1,000 feet that is bordered on all sides by cover of not less than 800 feet width.

- When seeking to provide maximum forage for elk through a harvest method, choose the treatment which yields the highest Relative Value Index for forage production.

- A 3,800-acre home range should be the management unit in which an elk's seasonal requirements will be satisfied. Of the total cover requirement for a given unit, one-half should be hiding cover, one-fourth thermal cover, and one-fourth any combination of hiding and thermal cover. One-fourth of all hiding and thermal cover should also qualify as security cover.

SLASH DISPOSAL METHODS

Point of Concern

The accumulation and treatment of logging debris or slash is inherent with any timber harvest action. This byproduct of timber harvest has the potential to affect elk behavior and movement both in the cut area and adjoining uncut area. The method of disposal utilized will affect the vegetative response towards elk forage production.

Research Findings

Lyon (1976) stated that elk use diminished when slash inside the opening exceeded 0.5 meters (1.5 feet) in depth and dead and down material outside the opening exceeded 0.5 meters (1.5 feet). The treatment of the slash, be it seasonal broadcase burning; handpiling and burning; or lop and scatter, will affect the degree and amount of elk forage produced on the treatment site, assuming the potential does exist (Irwin 1976).

Recommendations

- In order to insure the highest elk use possible on logged areas, particularly forage areas, slash depth should not exceed 0.5 meters (1.5 feet).

- When developing an area with elk forage production as a consideration, use a slash disposal treatment which will yield the highest value for forage production.

TIMING AND DURATION OF TIMBER HARVEST

Point of Concern

The season of the year and the length of time during any one year that logging operations disturb areas inhabited by elk influence normal use patterns of the animals. It is important that considerations regarding conflicts between elk use and logging activities be realized and the two be coordinated to mitigate adverse impacts resulting from the displacement of the animals.

Research Findings

Lyon (1975) stated that displacement of elk, which is considered temporary, has been detected as far as 4 miles from the area of summer logging activity. Ward (1976) found that elk preferred to be at least 0.5 miles from logging activity.

Recommendations

- In that sales are currently designed to run the shortest period of time, it is necessary to work within the specified time frame by designating compartments and order of logging through sale layout and contract stipulations to eliminate random logging over the entire area.

- Where feasible, logging whould not be conducted on areas at the time of year when elk would normally be using them. For example, refrain from logging winter ranges during the winter months.

- Within the plan for timber sales on elk summer range, provide adjacent security areas for the animals to move into during periods of timber harvest or road building activity.

SPECIAL HABITAT COMPONENTS

Point of Concern

Within the spring, summer, and fall ranges of elk there are certain special physical components or habitat areas which receive an inordinate amount of elk use. These include salt licks, wallows, established travel routes, and calving areas. The conservation and protection of these areas is considered to be important in preserving the integrity of the seasonal habitat.

Research Findings

Moist Sites

In the findings and recommendations of the Montana Cooperative Elk-Logging Study (Allen et al. 1977), the importance of moist sites in elk summer range is stressed. In Montana, most of the important wet sites were located within the Abies lasiocarpa habitat series (Pfister 1976); however, these components in northern Idaho may also be found in those types within the pachistima union (Daubenmire 1968). These sites are found in drainage heads bordering streams or marshy meadow; moist swales; or benches. Studies indicate these sites are important as food souces prior to the breeding season and during the reproductive period. They also provide thermal and security cover.

Wallows

Elk wallows are shallow pools normally located in boggy areas or where water seeps from a slope onto a flat bench. Murie (1951) indicates its function is to soothe the rutting bull by cooling the body and serving as an outlet for pent up energy. Struhsaker (1967) speculated that "...the function of wallowing is to facilitate the location of bulls by one another." Cow elk use the wallows in similar fashion to the bulls in later summer. Often the wallows remain as clear pools during the spring and early summer to provide a water source for elk and other species. Wallows are a preferred habitat component for elk and are used to varying degrees when available.

Licks

Elk utilize mineral licks when available. In northern Idaho, most of these licks are the sites of past and current salting programs (either for game or livestock) or where naturally salty water and/or soil is present. Dalke et al. (1965) analyzed the water from natural salt licks in north-central Idaho and found that sodium seemed to be the element attracting elk. They found elk use of licks to occur primarily between the third week in April and late August. Peak use occurred during the second and third weeks of June. They also reported that salt licks within succulent herbaceous areas were used considerably more than licks in shrubby areas.

Murie (1951) states "...that wild game species need salt is open to serious question...wild animals are adapted to natural food sources." However, Botkin et al. (1973) suggests that the availability of sodium on Isle Royale, Lake Superior, controls the moose population. So the question of how critically elk need these areas remains unanswered; however, as with wallows, licks are heavily used when available and we therefore believe in protecting them from disturbance.

Rub Areas

Prior to and during the rut, bull elk rub their antlers, removing the velvet and thus finalizing the hardening process. As the rut progresses, the rubbing and fighting of small trees is intensified. Some discussion has occurred over the preference for specific areas for use of "rub trees" by bulls during rutting season. It is our opinion that such areas coincide with preferred habitat components for other needs such as thermal and hiding cover and wallows or licks.

Calving Areas

The term "calving area" is given to those areas which the cow elk traditionally utilize for giving birth. These areas, though often hard to positively identify, have a mixture of components which make them attractive to the elk for calving purposes. Thomas et al. (1976) provided the following capsule description of probably calving habitat:

"In short, calving grounds are located in the transition zone where escape and thermal cover in the form of forests exist for the cows; where there is hiding cover in the form of shrubs or dead and down logs, etc., for relatively immobile newborn calves; where succulent forage is available for the lactating female; where water is within 305 meters (1,000 feet); and where the terrain is gently, allowing easy movement of the cow immediately before and after parturition."

Travel Lanes

Within forested areas, elk move from forage to cover areas and from one seasonal range to another along selected and traditional routes. Logging activities tend to disrupt or block these travel routes resulting in displacement or elimination of elk from formerly utilized habitats (Leege 1976 and Lyon 1975).

Recommendations

- Whenever these special components are encountered in connection with a timber sale action or questions arise as to their occurrence or importance, a wildlife biologist must evaluate these on a case-by-case basis.

- In regard to licks and wallows, these should be preserved and buffered from disturbance by a minimum of 1.5 sight distances.

- Whenever the existence of calving habitat is confirmed or expected, it should be reviewed by the wildlife biologist as it is considered to be an extremely important habitat component.

- Upon identifying the travel lanes, the following points should be considered: 1) maintain known travel routes in continuous hiding or thermal cover for at least three sight distances wide; and 2) travel lanes should be provided for saddles and ridges as these are points of heavy travel flow by the animals. These should be tied to forage and cover areas.

- If an area within a proposed timber sale exhibits a high density of "rub trees", an effort should be made to preserve that area or areas of similar physical and vegetative makeup within the home range.

- No activities associated with timber harvest or pre-sale activities such as road building can be permitted in calving areas from the period of May 1 through July 15 (Roberts 1974).

ROAD EFFECTS

That elk are adversely affected by roads is well documented in literature. Such adverse effects vary from disturbance due to presence of vehicular travel to increasing hunter access, thus allowing over harvesting of elk in localized areas.

Habitat Use and Roads

Studies indicate that elk do not frequent areas adjacent to roads in proportion to similar habitat in undisturbed areas. Hershey and Leege (1976) and Ward (1976) found elk use to be disrupted within .4 kilometers (.25 miles) on either side of a road. Coggins (1976) reported high road density and constant vehicle travel excluded elk from many areas of escape cover. Studies of the effects of roads on elk use by Perry and Overly (1976) found that generally, roads significantly reduced elk use of adjacent habitat below average levels.

Data indicate that elk respond less to constant non-stopping vehicular travel (usually associated with main roads) than to periodic slow vehicle use where vehicles stop and human activity is associated with it (Ward, 1976; Burbridge and Neff, 1976).

Human Access and Roads

The major consideration in the roading of elk habitat is the human access it will allow into elk sanctuary areas. Thiessen (1976) states, "The substantial reduction of elk...between 1960 and 1974 was probably caused by direct overharvest of female elk. This was made possible by a combination of proliferating access into the unroaded elk sanctuaries, coupled with hunting seasons promoting high level hunting opportunity."

Leege (1974) believed that the decline of elk in the Pete King Creek area was due to "increased access into the timbered portions of the drainage brought about by numerous logging roads (making) elk more vulnerable to hunters...." The size of security areas that should remain after logging will vary with the distance from open roads, since most hunters do not penetrate much beyond one mile from an open road (Ream et al. 1974).

Roads may limit or exclude elk use of preferred habitat when:

- Road locations are such that adequate buffer strips are not provided between the road and the habitat in question.

- Road density is such that minimum security cover needs are eliminated.

- Road activity is such that elk tolerance limits are exceeded.

- Road locations that interfere with major travelways, such as saddles and ridge tops.

Roads may become barriers to elk movements when:

- Cut slopes are over 2.5 meters (8 ft.) high with a 3/4 to 1 or steeper slope.

- Slash on fill slopes (below road) is in excess of 0.5 meters (1.5 feet) deep and has less than one opening per 200 meters.

Recommendations

- All elk trails crossed by roads should provide access on cut slopes not to exceed natural gradients. If slash is piled along roads, openings 4 meters wide are required at trail crossings.

- Where cut slopes are over 2.5 meters (8 feet) in height and/or have a greater than .75 to 1 slope, elk access will be provided at major trails and travelways.

- Slash disposal for road construction shall be such that no barriers to elk movement are created. Slash depths should not exceed 0.5 meters in depth. In areas where complete slash disposal is impractical, openings 4 meters (13 feet) wide at 200 meter (650 feet) intervals are essential.

- Narrow rights-of-way should be maintained. Vegetation removal along roadsides should not extend further than excavation or fill.

- Roads near meadows and other openings, including cutover areas, should have a minimum of a 400 meter (1,300 feet) forested barrier between the road and the opening.

- Roads should avoid saddles and ridge tops whenever possible.

Road Closures

The ability to close roads provides the land manager with numerous options to control land uses in a given area.

Permanent Closures

Permanent closures have many advantages in that they insure greater security for elk and provide increased forage when the roadbed revegetates to native and planted species. In any sale area, all temporary and spur roads should normally be permanently closed.

Temporary Closures

Temporary closures may be utilized on system roads where continued access is necessary. Temporary closures may be implemented to:

- Reduce hunter access. This would provide elk with sanctuaries during hunting season. These closures should be initiated beginning September 1 and continue through the elk hunting season.

- Protect special habitat. Such closures would provide protection to wallows, calving areas, security cover, etc.

- Reduce stress to wintering elk. Such closures would protect elk on wintering ranges from harrassment by snowmobilers and other motorized activity.

Gate Closures

Gates provide the option to permanently close roads; to close to public access but allow administrative uses; to close during period when resource damage can occur; or to provide for future closure should indications of resource damage occur.

Recommendations

- Gates should be installed at onset of road building activity.

- Gates entering any active timber sale area should be closed and locked during any period of inactivity exceeding 48 hours.

- Gates should be signed to indicate: 1) the season or period of closure, and 2) the reasons for closure.

Buffer Strips Along Roads

Constant human activity and traffic on forest roads left open to motorized travel serve to render portions of otherwise usuable habitat useless to the elk. From this standpoint, it is necessary to utilize buffer strips to reduce the adverse impacts on roads that cannot be closed.

Recommendations

- Allow for hiding cover to act as buffer strips along permanent open roads.

- Tie these buffer strips to travel lanes which are provided throughout the sale.

- The accepted width of a given buffer strip should be minimum of 1.5 sight distances.

GRAZING AS RELATED TO SILVICULTURAL PRESCRIPTIONS

On occasion, specific silvicultural prescriptions may allow for short-term livestock grazing opportunities. The effects of livestock grazing as it applies to elk and their habitat indicate, for the most part, that competition for forage exists and that inter-specific interaction occurs.

Predicting Elk Responses to Habitat Changes and Distubrance Factors

Cover:Forage Ratios

Wildlife biologists in northern Idaho generally concur that on summer and spring-fall range cover is a more important component of elk habitat than forage since it is more frequently lacking. Consequently, when logging, there is a greater potential for reducing elk use by removing cover than there is for increasing elk use by improving forage production. However, on winter and early spring ranges, forage requirements are commonly higher than the habitat can easily provide. Hence, on these ranges, forage production increases which result from logging can be a major benefit.

Some habitat types are especially important as summer range because of the high water table and subsequent cool temperatures and succulent vegetation they possess. Maximum elk use is assumed to occur in these areas when 75 percent is in cover. Any further removal of canopy tends to decrease the attributes elk seek there during the hottest part of the year.

Other habitat types provide dense thermal cover on summer and spring-fall ranges but are not as moist and, therefore, not as attractive to elk during mid-summer. These areas can be made more attractive by increasing forage production which will be utilized by elk primarily during spring, early summer, and late fall.

A third category of habitat types occurs primarily at lower or higher elevations where summer use by elk is usually light because of a lack of thermal cover and/or inherently poor forage production. The low elevation habitat types are more commonly used by elk during the winter and early spring months, and any logging should be evaluated in light of elk needs at those times of the year. In some cases it will be necessary to establish season of use by ground surveys before logging can be properly evaluated.

On winter ranges, forage is usually a more critical factor than is cover. A forage:cover ratio of 75:25 is best where snow depths are less than 1.5 feet on the ground during most days of an average winter. Cover needs are minimal on this type of winter range if isolated from man's activities (Leege and Hickey 1977). However, Montana studies indicate elk prefer dense timber stands and larger trees for bedding cover. These areas are normally near foraging areas. Bedding areas were abandoned following heavy selection logging (Beall 1976). When snow depths average 1.5 to 2.5 feet, a 60:40 ratio is necessary. On winter ranges where snow depths are more than 2.5 feet on most winter days, a 40:60 ratio provides optimum habitat. The additional cover is necessary to intercept the snow and provide for ease of movement. However, the proper ratio and snow depths are only one factor of winter range needs. Range quality is largely determined by the amount of palatable and nutritious browse being produced in forage areas. Other important factors include aspect, location, and juxtaposition with other habitat requirements.

Roads

It should be made clear at this point that optimum habitat assumes a proper distribution of cover and forage and also, more importantly, that the habitat is not being adversely influenced by man. When frequent man-associated disturbances are introduced, an elk's need for cover increases significantly. Roads are the means by which most man-associated disturbances arrive on elk ranges, and consequently, a method of predicting effects of roads on elk use has been devised.

Adjacent Areas

An area proposed for a timber sale cannot be properly evaluated for elk use without giving some consideration to surrounding habitat. The optimum forage:cover ratio in the proposed sale area will depend to some extent on the forage:cover ratios and access roads in the areas on all sides of it. For example, a 100-acre patch of standing timber is more important as hiding and/or thermal cover if the 500 acres immediately adjacent on all sides have been recently clearcut than if similar timber still remains on all sides.

Sales should be evaluated on how they affect not only the area within the sale boundary, but the entire home range of the elk which use the sale area. As noted earlier, the average summer home range for a cow elk is about 6 square miles (3,800 acres) (Zahn 1974 and Ream et al. 1974). We propose this to be the size of the land unit on which a logging sale impacts elk. To define this area, the center of the sale area is estimated and serves as the center of a circle which encompasses the home range acreage.

If the sale area is larger than 3,800 acres, home range acreage need not be considered, and only the area within the sale boundary is evaluated. If portions of the sale area lie outside the home range circle, those portions should be included in both the sale and home range acreages. The term "adjacent area" then refers to that area outside of the sale area boundaries but within the home range.

Computation Methods and Forms

To aid in assessment of present and proposed land use practices on elk populations and to provide a common means of displaying these data, a system of computation sheets has been developed. This system provides the land manager with a sequential method in which to array the factors affecting elk populations in a specific land area.

Analysis of Impacts of the Proposed Action and Alternative

Each of the proposed timber sales in the sample 3-year timber sale plan was evaluated as to whether it was elk summer range. If it was, it was analyzed using the elk guidelines computation sheets. The results of the computations are summarized in Table A following this narrative. The impact summary documents the anticipated impacts of the sales on elk habitat, the average of these values are then used in Table A of Appendix 4-2.

The elk guidelines are not applicable to one timber sale, Cottonwood Divide Creek. Computation gives impacts entirely in excess of the actual situation in the opinion of the biologist in the Chief Joseph Resource Area (Craig Johnson, personal communication, April 1980). This is probably because of the definite change in habitat occurring in that area. To arrive at usable figures the results of timber activities and roads are estimated to be one-third the computation. One must realize that the assumption was made that the 3-year sample is representative of the type of action that will occur and of the areas in which sales will occur.

APPENDIX 2-3, TABLE A
ESTIMATED IMPACTS ON ELK SUMMER HABITAT OF SALES IN THE SAMPLE 3-YEAR PLAN

	Existing habitat in relation to its potential, reductions from optimum					Impacts of the sales - reductions from optimum					Impact Summary				Significance	
Timber Sale	Cover/ Forage	Roads	Other	Total	Remaining	Cover/ Forage	Roads	Other	Total	Remaining	Cover/ Forage	Roads	Other	Total	Threshold[1]	Threshold Exceeded?
Hunter-Trapper	-2	-19	-2	-23	77	-2	-25	-2	-29	71	0	-6	0	-6	-39(-50%)	No
Elmira	-36	0	-8	-44	56	-50	0	-8	-58	42	-14	0	0	-14	-28(-50%)	No
Revenue Gulch	-15	-45	0	-60	40	-5	-10	0	-15	85	+10	+35	0	+45	-20(-50%)	No
Squaw Creek	-19	-29	0	-48	52	-18	-30	0	48	52	+1	-1	0	0	-26(-50%)	No
Two-tall Peak	-2	-43	0	-45	55	-2	-42	0	-44	56	0	+1	0	+1	-28(-50%)	No
Otts Basin East	Not Elk Range															
Daveggio Knob	-2	-43	-3	-48	52	0	-43	-2	-45	55	+2	0	+3	+5	- 0(- 0%)	No
South Side																
St. Joe Baldy	-2	-30	-0	-32	68	-2	-30	-0	-32	68	0	0	0	0	- 0(- 0%)	No
Curley Creek	-5	0	-5	-10	90	-0	-0	-5	-5	95	+5	0	0	+5	-45(-50%)	No
Reeds Gulch	-5	-34	0	-39	61	-4	-41	0	-45	55	+1	-7	0	-6	-30(-50%)	No
Rock Creek	-9	-19	0	-28	72	0	-21	0	-21	79	+9	-2	0	+7	-36(-50%)	No
Bridgeview	-4	-27	0	-31	69	-1	-28	0	-29	71	+3	-1	0	+2	-34(-50%)	No
Pete & Charley Ck.	-2	-47	-7	-56	44	0	-47	-7	-54	46	+2	0	0	+2	-22(-50%)	No
Schmit Creek	-1	-13	-23	-37	63	0	-14	-23	-37	63	+1	-1	0	0	-31(-50%)	No
Little Campbell Ck.	-28	-11	0	-39	61	-20	-32	0	-52	48	+8	-21	0	-13	-30(-50%)	No
Cottonwood																
Divide Creek[2]	-11	-13	-26	-50	50	-19	-15	-26	-60	40	-8	-2	0	-10	-25(-50%)	No
Slate Creek	-2	-25	-27	-54	46	-1	-25	-27	-53	47	+1	0	0	+1	-23(-50%)	No
Partridge Creek	-6	-2	-10	-18	82	-2	-10	-10	-22	78	+4	-8	0	-4	-41(-50%)	No

[1] The thresholds of no reduction from existing habitat conditions on important areas such as calving areas, and an up to 50 percent reduction in quality on other summer range was established by Ray Rogers, Game Manager, Idaho Fish and Game, Region I, at an Elk-Roads Workshop at Priest Lake, Idaho, on January 8, 1980 as acceptable.

[2] Elk Guidelines are not applicable. Figures are estimates (personal communication Craig Johnson, Chief Joseph Resource Area Biologist, April 2, 1980).

SOURCE: BLM, Coeur d'Alene District, 1980.

APPENDIX 2-4

COEUR D'ALENE DISTRICT ROAD GUIDELINES

INTRODUCTION

The following general guidelines were developed to provide an adequate useable road system while protecting the environment. This expands and supplements the basic guidelines and minimum requirements of the BLM manual; Idaho Department of Water Resources (IDWR) (stream channel protection); Idaho Department of Health and Welfare; Division of Environment (Forest Practices Regulations); and Corps of Engineers 404 Regulations. These guidelines must be flexible, and any deviations would be noted and assessed in the environmental assessment process.

ROAD PLANNING

Road planning in the district would be based on the need to provide an adequate road system to effectively manage the public lands while protecting the resources of the areas. The following guidelines are designed to meet these objectives:

- All roads would be planned and developed in cooperation with other land owners. Plans would be made to serve tributary areas of drainages or ownership block so that only the minimum amount of road necessary to meet management objectives would be planned. Road planning would take into account the long range road needs, expected duration of use of the road, the management objectives, and other policy constraints.

- The road planner must be able to recognize potential impacts to resource values, i.e., silviculture, soils, water, fisheries, wildlife, visual, recreation, etc., and will consult with appropriate specialists when problems are suspected.

- The planned location and design of roads would minimize detrimental impacts on the other resources of the area. Roads will be planned to avoid sensitive and important areas such as wetlands; floodplains; riparian areas; stream zones; big game use areas; threatened and endangered resource habitat areas; cultural or historical sites; scenic views; mass failure hazard areas; etc. Where it is not practical to totally avoid these areas and it is determined the road is necessary to meet management objectives, mitigation would be included in the design of the road.

- Use of existing roads would be favored over construction of new roads when continued use or reconstruction would result in meeting management objectives without major cost increases while causing the least long run impact to the site.

- In the planning stage, temporary or permanent closure will be considered for all dead end roads or roads with an expected duration of use of 5 years or less.

- Plan roads to be located on natural benches or ridges away from stream courses. Consider using the steepest permissible pitches and grades at stream crossings to avoid closely paralleling the stream for long distances. Planned stream crossings would be kept to a minimum.

- In planning a road system in a municipal watershed, the major objective would be to maintain or improve the quality of domestic water.

ROAD DESIGN AND SPECIFICATIONS

Roads would be designed to meet management objectives using the following guidelines:

- Roads would be designed to be no wider than necessary to accommodate the anticipated use.

- Where feasible, minimize cuts and fills by designing the road to fit the natural terrain.

- Balanced cut and fill road designs would be used where practical. Where not practical, waste areas would be designed so excess material would be placed in stable areas and borrow pits would be designed to minimize impacts to other resource values.

- When roads are planned on slopes exceeding 60 percent, they would be designed so that the road is on a full bench section. Excess material would be placed in stable areas.

- Design roads to leave vegetation that would screen streams, important wildlife areas, and areas of visual contrast (see Buffer Guidelines and Elk Coordinating Guidelines). Vegetation removal would not extend further than the fill limits or 3 feet beyond the excavation limits.

- Stream crossings would be selected and designed to involve the least disturbance to banks and existing channels. In doing so, approaches would be designed as near to a right angle with the stream as possible.

- On roads with a life span longer than 5 years, bridges or culverts would be designed for all natural water courses. No bridge or culvert should constrict the natural channel.

- Culverts in natural drainage ways would be oriented to the stream channel and would be designed, using half rounds or downspouts, to carry water beyond fills. Protection measures such as riprap would be used to protect streambanks and fills at upstream and downstream ends of culverts and bridges from erosion.

- Relief culverts would be designed with a minimum slope of one percent with sediment catch basins at the culvert mouth. Drainage structures on streams identified as having spawning potential or important fisheries would provide for fish passage. Bridges or natural bottomed culverts are preferable, but if standard culverts are used, they would be designed to meet or exceed Idaho Department of Water Resources (IDWR) regulations and Idaho Fish and Game (IF&G) criteria.

- Road drainage systems would be designed to avoid direct sediment discharge into streams. Use the U.S. Forest Service "Guide for Controlling Sediment from Secondary Logging Roads" to assist in drainage design.

- Design roads to drain naturally, where possible. Roadside ditches and relief culverts would be designed whenever reliance on natural drainage would not protect the running surface or excavation and embankment areas.

- Soil properties and geologic conditions along the planned road route will be determined before road design begins. These properties and conditions would be included in the design.

- Slash disposal areas and features would be included in the design. Slash and debris may be windrowed along the toe of the fill if it is outside the stream protection zone and poses no barriers to wildlife.

- Soil surface stabilization, i.e., riprap, seeding with grasses, or mulching would be designed for all areas where soils are disturbed, especially on large fill areas.

- When roads must cross mass failure hazard areas such as slumps and scarps, the road design must provide for positive stabilization of the road across the hazard area. Large fill and unstable areas would be protected by surface drainage diversion systems.

- When roads must cross poorly drained or wet soils, the road prism would be designed with a structurally adequate subbase to support expected traffic loadings and with an adequate drainage system.

- Design surface treatments (i.e., rock surfacing) for roads constructed from fine plastic soil materials to prevent rutting in wet conditions and dust problems in dry seasons if road use is planned during these times.

- Design landing areas into the road system. Landings would be designed to be of minimum size necessary and located on stable areas outside stream buffer zones.

ROAD CONSTRUCTION

Roads would be constructed utilizing good construction practices. They would be designed to minimize impacts on the area and include incorporation of the following guidelines:

- Earthwork on roads would not be done when soils are saturated or frozen or during wet periods when material can be eroded and deposited outside the roadway corridor. On cohesive soils, no construction would be done when the soils are in a liquid state or in the upper one-third range of the plastic state.

- Before the end of an operating season and before winter or spring erosion periods, the road segments would be surface bladed or cross drained as needed, and drainage structures would be installed. Other surface protection measures would be taken to minimize erosion from the road corridor.

- During construction, road fill material would be compacted to reduce the entry of water, minimize erosion, and reduce settling. No significant amount of woody material would be incorporated into fills.

- In rippable materials, roads would be constructed with no overhanging banks. Any trees that would be a hazard would be felled concurrent with the construction operation.

- Potentially unstable or erodible material exposed (i.e., road embankments) or generated (i.e., waste piles) during construction would be stabilized as soon as feasible by seeding, compacting, riprapping, benching, mulching, or other suitable means.

- Drainage structures would be installed as soon as feasible. If not feasible, cross drains would be installed.

- All drainage ways would be cleared of debris generated during construction.

- During and following operations on out-sloped roads, drainage would be retained by removing berms from the outside edge except those intentionally constructed for protection of large fills.

- In municipal watersheds, gravel would not be taken from the stream beds and washing operations would not be located in the watershed above the municipal water intake. Machines would not be permitted in streambeds except for approved purposes such as preparation of a site for a culvert or bridge. The municipality and BLM would be notified before any work in a streambed begins.

Road Maintenance

A maintenance program is important to avoid deterioration of the road system and minimize the disturbance and damage to other resources. The following guidelines are applicable to road maintenance activities:

- All cutbanks, fills, and stream crossings that have been recently seeded or stabilized would be checked annually.

- Debris or slide material associated with road maintenance would be placed so as not to enter streams or create wildlife barriers. Graders would leave ditches functional and would not leave undercut sideslopes. All culverts would be cleaned after grading to ensure they are open.

- All slumps, slides, and other road erosion features causing stream sedimentation would be repaired or stabilized during maintenance.

- If road oil or other surface stabilizing chemicals are used, apply them in such a way to prevent their entry into streams. Road oil would not be placed in road ditches or waterways and would not be permitted to pool on the road surface.

- Road surfaces and drainage structures would be maintained as necessary to keep the road up to the design standards.

- Roads should be inspected after spring runoff and intense or prolonged rainstorms to determine the need for immediate corrective maintenance or improvement of erosion stabilization measures. Roads located in municipal watershed would be top priority for these inspections.

- Berms of ice and snow created by hauling during winter would be broken before spring runoff begins.

- Following termination of active use, roads would have ditches and culverts cleaned and the road surface maintained to design specifications.

- Roads that have no planned use in the immediate future would be closed to vehicular traffic.

- Roads would be checked periodically or after major runoff events to determine if maintenance is needed.

- Roads are left in a condition suitable to control erosion by outsloping, water barring, seeding, and other suitable stabilization methods.

- Ditches would be cleaned and left in functional condition.

- All bridges and culverts on roads to be closed would be evaluated to determine whether they need to be removed or maintained periodically.

APPENDIX 3-1, TABLE A

PROPERTIES AND INTERPRETATIONS OF COEUR D'ALENE DISTRICT SOILS

Series	Mean Elevation (feet)	Precipitation Zone (Inches)	Classification Family Subgroup	Position On Landscape	Parent Material	Texture Surface Soil / Subsoil	Dominant Slope Range (Percent)	Aspect	Coarse Fragments (Kind & %)	Profile Depth (Inches)	Permeability	Drainage	Available H_2O Holding Capacity (Inches)	Compaction Hazard	Major Limitations
Ardenvoir	2,000-5,000	20-32	Loamy Skeletal. Typic. Xerochrepts.	Mountainous Slopes	Schist	L StL	25-65	All	Gravel-Stone 35-75	20-40	Moderate	Well	3-6	Moderate	Erosion, Droughty, Steep
Artnoc	1,800-2,700	21-24	Coarse-Silty, Mixed, Frigid. Psammentic. Haploxeralfs.	Mountainous Slopes	Glacio Lacustrine Sediments	SIL SIL	30-70	All	-----------	40+	Moderate-Slow	Moderate-Well	6-9	Moderate	Erosion, Steep
Bane	1,500-2,600	20-25	Sandy, Mixed. Typic. Cryorthents.	Alluvial Fans	Granitic Alluvium	LFS Strat. StG	0-15 (2-8)	All	Gravel 10-35	40+	Rapid	Excessively	3-6	Moderate	Droughty
Benewah	2800-3,500	26-30	Fine-Silty, Mixed, Frigid. Ultic. Haploxeralfs.	Mountain Foot Slopes	Loess Mudflows	SIL SICL	5-35	All	-----------	40+	Slow	Moderate-well	9-12	High	Erosion, Compaction
Blinn	2,100-3,200	25-28	Loamy-Skeletal, Mixed, Frigid. Typic. Xerochrepts.	Plains & Foot Slopes	Basalt	StL LVStL	5-65 (15-35)	N	Stone 50-70	20-40	Moderate	Well	3-6	Low	Erosion, Droughty
Bluesprin	2,200-5,000	16-21	Loamy-Skeletal, Mixed, Mesic. Ultic. Argixerolls.	Mountainous Slopes-River	Loess Basalt or	gL VCbCL	7-90	SW	Gravel-Cobble Rock Fragments 35-80	20-40	Moderate-Slow	Well	3-6	High	Droughty
Brickel	4,500-6,500	35-45	Loamy-Skeletal, Mixed. Typic. Cryoborolls.	Mountainous Slopes	Granitic (Gneiss)	StL VCbL	30-80	All	Rock Fragments 35-70	20-40	Moderate	Well	1-3	Low	Droughty, Stony, Steep
Brody	2,100-6,000	28-40	Loamy-Skeletal, Mixed. Andix. Cryochrepts.	Uplands & Mountainous Slopes	Basalt	CbSIL VgSIL	5-90	---	Rock Fragments 50-80	20-40	Moderate	Well or Excessive	3-6	Low	Erosion, Droughty
Caboose	1,800-2,700	20-24	Coarse-Silty, Mixed, Frigid. Psammentic. Haploxeralfs.	Mountainous Slopes	Glacio-Lacustrine Sediments	VFSL SIL	35-75	---	----------	40+	Moderate	Well	9-12	Moderate	Erosion, Steep
Caribel	2,800-3,500	27-30	Fine Loamy, Mixed, Mesic. Ultic. Hapludalfs.	Level to Steep Uplands	Residuum from Basalt	SIL SICL	0-40 (3-15)	All	----------	40+	Moderate-Slow	Well	9-12	High	Erosion, Compaction
Chatcolet	2,300-2,800	25-30	Fine-Silty,Mixed. Andeptic. Cryoboralfs.	Terraces	Glacio-Lacustrine	SIL SICL	3-40 (5-20)	All	----------	40+	Moderate-Slow	Moderate-Well	9-12	High	Erosion, Compaction
Crash	1,800-2,700	21-24	Coarse-Silty, Mixed, Frigid. Psammentic. Haploxeralfs.	Mountainous Slopes	Glacio-Lacustrine Sediments	SIL SIL	30-75	---	----------	40+	Moderate-Slow	Moderate-Well	9-12	Moderate	Erosion, Steep

APPENDIX 3-1, TABLE A (Cont.)
PROPERTIES AND INTERPRETATIONS OF COEUR D'ALENE DISTRICT SOILS

Series	Mean Elevation (feet)	Precipitation Zone (Inches)	Classification Family Subgroup	Position On Landscape	Parent Material	Texture Surface Soil Subsoil	Dominant Slope Range (Percent)	Aspect	Coarse Fragments (Kind & %)	Profile Depth (Inches)	Permeability	Drainage	Available H_2O Holding Capacity (Inches)	Compaction Hazard	Major Limitations
DeMasters	2,000-6,000	17-23	Fine Loamy, Mixed, Frigid. Pachic Ultic. Agrixerolls	Mountainous Slopes	Basalt Colluvium	L L	20-90 (45-70)	N	Gravel Rock Fragments 20-35 50-80	40+	Moderate	Well	6-9	Moderate	Erosion, Steep
Divers	3,000-6,000	40-100	Medial-Skeletal. Andic. Cryochrepts.	Mountainous Slopes	Basalt Colluvium	gL VgL	45-75	---	Hock Fragments 35-50	40+	Moderate or Moderate-Rapid	Well	6-9	Low	Erosion, Steep
Dorb	2,100-3,200	25-30	Medial-Skeletal. Typic. Cryandepts.	Plateaus Terrace Escarpments Mountain Canyons	Volcanic Ash Basalt	SIL VCbSIL	5-65	---	Cobble 35-90	20-40	Moderate	Well	1-3	Low	Erosion, Droughty
Elmira	2,000-2,500	23-28	Mixed, Frigid. Alfic. Xeropsamments.	Terraces	Glacio Lacustrine Sediments	LS S	0-20	All	--------	40+	Rapid	Excessively	3-6	Moderate-High	Droughty
Ericson	3,800-4,800	26-32	Fine Loamy,Mixed. Typic. Cryoboralfs.	Mountainous Slopes	Granitic Colluvium	L FgL	4-65	S	Gravel 10-35	40+	Moderate-Slow	Well	6-9	Moderate	Erosion
Farnhamton	1,700-2,000	20-24	Coarse-Silty, Mixed (Cal) Frigid. Aquic. Xerofluvents.	Terraces	Alluvial	SIL SIL	0-10	All	-------	40+	Modorate	Moderate-Well	9-12	High	Compaction
Garveson	2,300-3,200	30-40	Medial over Sandy or Sandy Skeletal. Andic. Cryocherpts.	Mountainous Slopes	Volcanic Ash Granitic	L gS	35-65	---	Gravel 35+	40+	Moderate	Well	3-6	Moderate	Erosion, Droughty
Gwin	1,900-4,500	14-28	Loamy Skeletal, Mixed, Mesic. Lithic. Argixerolls.	Basalt Plateaus Rocky Ridges Steep Canyon Walls	Basalt	CbSIL VCbSICL	10-85	---	Rock Fragments 45-65	10-20	Moderate	Well	1-3	High	Shallow, Droughty, Steep
Helmer	2,700-4,500	28-42	Medial, Frigid. Andic. Fragiochrepts.	Plains	Loess	SIL SIL	3-40	---	-------	40+	Slow	Moderate-Well	9-12	High	Erosion, Compaction
Huckleberry	3,000-6,000	25-40	Medial/Loamy Skeletal,Mixed. Entic. Cryandepts.	Mountainous Slopes	Loess & volcanic ash Quartsite-Sandstone-	SIL gSIL	15-70	N at Lower Elevation	Rock Fragments 35-60	20-40	Moderate	Well	3-6	Moderate	Erosion, Droughty
Idamont	2,800-4,400	30-40	Medial over Loamy, Mixed. Entic. Crydandepts.	Mountainous Slopes	Volcanic Ash Glacial Till	SIL SIL	15-50	---	Gravel-Cobble 10-35	40+	Moderate	Well	6-9	Moderate	Erosion

APPENDIX 3-1, TABLE A (Cont.)
PROPERTIES AND INTERPRETATIONS OF COEUR D'ALENE DISTRICT SOILS

Series	Mean Elevation (feet)	Precipitation Zone (Inches)	Classification Family Subgroup	Position On Landscape	Parent Material	Texture Surface Soil / Subsoil	Dominant Slope Range (Percent)	Aspect	Coarse Fragments (Kind & %)	Profile Depth (Inches)	Permeability	Drainage	Available H_2O Holding Capacity (Inches)	Compaction Hazard	Major Limitations
Jacot	2,300-3,200	30-40	Coarse-Loamy, Mixed. Andeptic. Cryoboralfs.	Mountainous Slopes	Volcanic Ash / Granitic	SL / CoSL	35-65	---	-------	40+	Moderate-Rapid	Well	6-9	Moderate	Erosion, Steep
Jughandle	3,300-7,000	25-45	Coarse-Loamy, Mixed. Typic. Cryochrepts.	Mountainous Slopes	Acid Igneous Rocks	SL / CoSL	7-90	N	-------	40+	Moderate-Rapid	Excessively	3-6	Moderate	Erosion, Droughty Steep
Klicker	2,500-5,000	24-40	Loamy-Skeletal, Mixed, Frigid. Ultic. Argixerolls.	Uplands	Basalt	SIL / CbSICL	30-85	---	Gravel-Cobble 35-50	20-40	Moderate-Slow	Well	3-6	High	Erosion, Droughty, Steep, Compaction
Klickson	1,500-5,000	24-28	Loamy-Skeletal, Mixed, Frigid. Ultic. Argixerolls.	Steep Canyon Slopes	Loess / Basalt	SIL / VCbSIL	39-85	N	Cobble 10-35	40+	Moderate	Well	6-9	High	Erosion, Steep
Kooskia	2,000-3,300	23-26	Fine Montmorillonitic Mesic. Xeric. Argialbolls.	Uplands	Loess / Basalt	SIL / SICL	3-25	---	-------	40+	Slow	Moderate-Well	9-12	High	Erosion, Compaction
Kriest	1,800-3,200	20-24	Coarse-Loamy, Mixed, Frigid. Dystric. Xerchorepts.	Mountainous Slopes	Glacial Till	gSL / gLS	5-65	---	Gravel 15-35	40+	Moderate-Rapid	Well	3-6	Moderate	Erosion, Droughty
Lacy	1,500-3,200	22-28	Loamy-Skeletal, Mixed, Mesic. Lithic Ultic. Argixerolls.	Breaks Mountainous	Basalt Colluvium	StL / StCL	5-65	S	Gravel-Cobble 25-80	10-20	Moderate	Well	1-3	High	Shallow, Erosion, Droughty
Lawyer	1,200-4,000	16-22	Loamy-Skeletal, Mixed, Mesic. Pachic Ultic. Argixerolls.	Canyon Slopes	Loess & Basalt Colluvium	L / VgCL	25-65	N	Gravel 35+	40+	Slow	Well	6-9	High	Erosion, Compaction
Lickskillett	800-3,600	10-12	Loamy-Skeletal, Mixed,Mesic. Aridic Lithic. Haploxerolls.	Canyon & River Breaks	Basalt Colluvium	gL / gCL	40-70	---	Rock Fragments 40-85	10-20	Moderate	Well	1-3	Moderate	Shallow, Droughty, Steep
Lochsa	2,200-4,000	25-36	Coarse-Loamy, Mixed, Frigid. Pachic. Haplumbrepts.	Canyon Breaks Mountainous Slopes	Granitic	SL / gCoSL	25-90	---	Gravel-Cobble 15-35	40+	Moderate-Rapid	Excessively	3-6	Moderate	Erosion, Droughty Steep
McCrosket	2,500-4,000	24-27	Loamy-Skeletal, Mixed, Mesic. Ultic. Hapolxerolls.	Mountainous Slopes	Metasediments of Belt Series	gSIL / Vg or StSIL	5-65 (30-40)	N at lower elevation S & ridgetops at higher elevation	Gravel-Coble 35-80	40+	Moderate	Well	3-6	Low	Erosion, Droughty

APPENDIX 3-1, TABLE A (Cont.)
PROPERTIES AND INTERPRETATIONS OF COEUR D'ALENE DISTRICT SOILS

Series	Mean Elevation (feet)	Precipitation Zone (Inches)	Classification Family Subgroup	Position On Landscape	Parent Material	Texture Surface Soil / Subsoil	Dominant Slope Range (Percent)	Aspect	Coarse Fragments (Kind & %)	Profile Depth (Inches)	Permeability	Drainage	Available H_2O Holding Capacity (Inches)	Compaction Hazard	Major Limitations
Melhorn	1,100-5,000	16-22	Fine-Loamy, Mixed, Mesic. Typic. Argixerolls.	Foothills & Mountainous Slopes	Basalt	StL/CbCL	2-65 (5-25)	---	Gravel-Cobble 15-50	20-40	Slow	Well	3-6	High	Droughty, Stony, Compaction
Minaloosa	2,800-3,800	26-32	Loamy-Skeletal, Mixed. Typic. Cryochrepts.	Mountainous Slopes	Metasediments	gL/gL	15-75	---	Rock Fragments 35-50	40+	Moderate	Well	3-6	Low	Erosion, Droughty
Molly	3,200-6,000	30-45	Coarse Loamy, Mixed. Andic. Cryochrepts.	Rolling to Steep Uplands	Granitic	SiL/CoSL	10-65	---	Gravel 10-15	40+	Moderate	Well to Excessively	3-6	Moderate	Erosion, Droughty
Nakarna	2,800-5,000	30-40	Medial Over Loamy. Andic. Cryumbrepts.	Mountainous Slopes	Colluvium from Schistose	SiL/FSL	5-75	---	Gravel 5-15	40+	Moderate	Well	6-9	Moderate	Erosion
Nez	4,700-7,500	25-35	Coarse-Loamy, Mixed. Pachic. Cryoborolls.	Sideslopes Swales in Uplands	Granitic	SL/CoSL	10-70	N at lower Elevation	Gravel 10-20	40+	Moderate-Rapid	Well or Excessively	6-9	Moderate	Erosion
Nazaton	2,400-4,500	24-28	Loamy-Skeletal, Mixed. Pachic. Cryoborolls.	Canyons & Mountainous Slopes	Granitic	gL/VgL	40-90	N	Rock Fragments 35-60	40+	Moderate-Rapid	Well	6-9	Low	Erosion
Nicodemus	1,100-5,320	18-27	Loamy-Skeletal, Mixed, Mesic. Cumulic Ultic. Haploxerolls.	Stream Bottoms Low Terraces	Alluvium	L/CbSL	0-15	---	Gravel-Cobble 35-60	40+	Moderate-Rapid	Moderate-Well	3-6	Moderate	Droughty
Pend Oreille	2,000-3,200	25-30	Medial over Loamy, Mixed, Frigid. Andic. Xerochrepts.	Mountainous Slopes	Glacial Drift	SiL/CbSL	15-65	---	Gravel 15-35	40+	Moderate	Well	3-6	Moderate-High	Erosion, Droughty
Porthill	2,000-2,400	20-23	Fine, Mixed, Frigid. Typic. Hapoxeralfs.	Terraces	Glacio-Lacustrine Sediments	SiL/SiCL	0-35	---	-------	40+	Slow	Moderate-Well	9-12	High	Erosion Compaction
Riggens	2,000-4,300	16-20	Loamy-Skeletal, Mixed, Mesic. Luthic Ultic. Argixerolls.	Mountainous Slopes	Loess Basalt Colluvium	gSiL/VgCL	7-60	S	Rock Fragments 35-75	10-20	Moderate-Slow	Well	1-3	High	Shallow, Compaction
Ritz	1,700-2,000	20-24	Coarse-Silty, Mixed (Cal) Frigid. Typic. Fluraquents.	Terraces	Alluvial	SiL/SiL	0-15	---	-------	40+	Moderate	Poor	9-12	High	Erosion, Compaction

APPENDIX 3-1, TABLE A
PROPERTIES AND INTERPRETATIONS OF COEUR D'ALENE DISTRICT SOILS

Series	Mean Elevation (feet)	Precipitation Zone (Inches)	Classification Family Subgroup	Position On Landscape	Parent Material	Texture Surface Soil / Subsoil	Dominant Slope Range (Percent)	Aspect	Coarse Fragments (Kind & %)	Profile Depth (Inches)	Permeability	Drainage	Available H₂O Holding Capacity (Inches)	Compaction Hazard	Major Limitations
Rubson	2,100-2,700	23-28	Coarse-Silty, Mixed, Frigid. Psammentic. Haploxeralfs.	Terraces	Glacio- Lacustrine	SIL SIL	2-20	---	-------	40+	Moderate	Well	9-12	High	Erosion, Compaction
Santa	2,300-3,000	26-28	Coarse-Silty, Mixed, Frigid. Typic. Fragiochrepts.	Rolling Plains	Loess	SIL SICL	3-35 (3-15)	---	-------	40+	Moderate-Slow	Moderate-Well	9-12	High	Erosion, Compaction
Selle	2,000-2,500	23-28	Sandy, Mixed, Frigid. Dystric. Xerochrepts.	Terraces	Lacustrine Sediments	FSL LFS	2-15	---	-------	40+	Moderate-Rapid	Well	6-9	Moderate	Erosion
Skalan	2,100-3,500	22-27	Loamy-Skeletal, Mixed, Mesic. Ultic. Haploxeralfs.	Mountainous Slopes	Gneiss on Related Rocks	gL ExgCL	5-65	All on low elev. S&W at higher elevation.	Gravel 35-80	20-40	Moderate	Well	1-3	Low	Erosion, Droughty
Spokel	2,800-4,500	24-26	Loamy-Skeletal Mixed, Mesic. Ultic. Haploxerolls.	Canyon Slopes	Granitic	ExgL ExgSL	40-90	---	Gravel-Cobble 35-70	40+	Moderate-Rapid	Well	3-6	Low	Erosion, Droughty, Steep
Stein	2,200-2,800	25-30	Medial-Skeletal Frigid. Typic. Vitrandepts.	Moranial Plains	Glacial Materials	gSIL VChSL	5-20	---	Gravel-Cobble 35-90	40+	Moderate	Well	3-6	Moderate	Droughty, Erosion
Suloaf	2,500-5,000	24-28	Fine-Loamy, Mixed, Frigid. Ultic. Argixerolls.	Plateaus, Mountainous Slopes	Loess and Basalt	SIL gSIL	3-90	N	Gravel 0-35	40+	Moderate	Well	69	Moderate	Erosion
Suttler	2,500-4,500	26-36	Coarse-Loamy, Mixed. Typic. Cryumbrepts.	Mountainous Slopes	Granitic	L FSL	7-90	---	Gravel-Cobble 10-35	40+	Moderate	Well	6-9	Moderate	Erosion
Tannahill	1,200-2,800	12-16	Loamy-Skeletal; Mixed, Mesic. Calcic. Argixerolls.	Canyon Slopes	Loess Basalt	VgSICL ExgL	7-90	S & W	Gravel 35+	40+	Moderate-Slow	Well	3-6	High	Droughty, Steep, Compaction
Teoka	2,000-4,000	20-24	Loamy-Skeletal, Mixed, Mesic. Ultic. Argixerolls.	Mountainous Slopes	Loess Shale- Sandstone	Shaly SIL VShaly SIL	2-45	---	Rock Fragments 35-60	20-40	Slow	Well	3-6	High	Erosion, Droughty, Compaction
Telcher	3,300-5,500	24-28	Fine-Loamy, Mixed. Mollic. Cryoboralfs.	Mountainous Slopes	Loess Basalt	SIL SICL	3-40	---	Gravel 5-35	40+	Moderate-Slow	Well	9-12	High	Erosion, Compaction

APPENDIX 3-1, TABLE A
PROPERTIES AND INTERPRETATIONS OF COEUR D'ALENE DISTRICT SOILS

Series	Mean Elevation (feet)	Precipitation Zone (Inches)	Classification Family Subgroup	Position On Landscape	Parent Material	Texture Surface Soil / Subsoil	Dominant Slope Range (Percent)	Aspect	Coarse Fragments (Kind & %)	Profile Depth (Inches)	Permeability	Drainage	Available H_2O Holding Capacity (Inches)	Compaction Hazard	Major Limitations
Treble	1,800-3,200	24-28	Loamy-Skeletal, Mixed, Frigid. Dystric. Xerochrepts.	Mountainous Slopes	Glacial Till	gSL/VgSL	3-40	---	Gravel 35-60	40+	Moderate-Rapid	Well	3-6	Low	Erosion, Droughty
Truefissure	4,500-8,000	50-70	Medial over Loamy Skeletal, mixed. Entic. Cryandepts.	Mountainous Slopes	Loess Argillite Quartzite Colluvium	SiL/gSiL	20-65	---	Gravel-Cobble 35-80	40+	Moderate-Rapid	Well	6-9	Moderate	Erosion
Vassar	2,500-5,000	30-45	Medial over Loamy, Mixed. Entic. Cryandepts.	Mountainous Slopes	Loess Granitic	SiL/CoSL	5-65	---	-------	40+	Moderate	Well-Excessively	6-9	Moderate	Erosion
Wapshilla	3,500-5,000	26-28	Loamy-Skeletal, Mixed. Mollic. Cryoboralfs.	Plateaus Mountainous Slopes Canyon Walls	Loess Basalt Colluvium	L/VgL	8-90	N on Canyon Walls	Gravel-Cobble 35-60	40+	Moderate	Well	6-9	Moderate	Erosion, Steep
Wishbone	1,800-2,700	20-24	Coarse-Silty, Mixed, Mesic. Psammentic. Haploxeralfs.	Mountainous Slopes	Glacio-Lacustrine Sediments	SiL/Sil	15-40	---	-------	40+	Moderate	Well	9-12	High	Erosion, Compaction.
Yakus	1,100-3,700	19-27	Loamy, Mixed, Mesic. Lithic. Haploxerolls.	Canyon Slopes	Granitic	CoSL/gL	12-65	S & W	Gravel 25	10-20	Moderate	Well	1-3	Low	Shallow, Droughty, Erosion, Steep
ZaZa	4,000-5,300	26-28	Loamy-Skeletal, Mixed, Frigid. Lithic. Eutrochepts.	Canyon Walls Mountainous Slopes	Basalt	VgL/VgL	7-40	S on Canyon Walls	Rock Fragments 35-75	10-20	Moderate	Well	1-3	Low	Shallow, Erosion Droughty Steep

APPENDIX 3-1, TABLE B

ACREAGE OF MAJOR SOIL ASSOCIATIONS IN COEUR D'ALENE DISTRICT

Major Mapping Units	Major Soils Series Within Mapping Unit	Acreage of Mapping Unit Within District
AL	Alluvial Land	1,837
B	Bluesprin	785
BK	Bluesprin-Klickson	7,354
BKR	Bluesprin-Klickson-Rock outcrop	4,020
BR	Bluesprin Rock outcrop	5,558
B12	Spokel-Brower	6,412
B32	Brody-Wapshilla	1,000
G	Gwin stony loam	707
GKR	Gwin-Klickson-Rock outcrop	928
H	Helmer	240
H12	Lawyer-Rock outcrop	1,547
Hb3	Huckleberry-Ardenvoir	1,080
J	Jughandle	10,091
K	Klickson	930
KB	Klickson-Bluesprin	5,675
KBR	Klickson-Bluesprin	460
KR	Klickson-Rock outcrop	12,908
KGR	Klickson-Gwin-Rock outcrop	3,635
K15	Klickson-Wapshilla	4,504
L12	Nasaton-Suttler	15,984
L23	Tannahill-Lickskillet complex	3,928
LoE	Lochsa Yakus	7,176
LR	Lickskillet-Rock outcrop	10,059
M22	Jughandle-Suttler	7,053
NBR	Nazaton-Brower-Rock outcrop	885
OB	Rock outcrop	5,724
R12	Brewer-Rock outcrop	2,980
RL2	Rock outcrop-Tannahill	7,590
RL6	Rock outcrop-Nazaton	3,410

APPENDIX 3-1, TABLE B (Cont.)

Major Mapping Units	Major Soils Series Within Mapping Unit	Acreage of Mapping Unit Within District
CA	Crash-Artnoc	12
FA	Franhamton	9
PM	Pend Oreille-Idamont	5,380
PR	Porthill	32
RP	Rock outcrop-Pend Oreille	10,836
RT	Rock outcrop-Treble	1,935
RU	Rubson	33
SL	Selle	14
SR	Selle-Elmira	15
ST	Stien	14
WB	Wishbone-Caboose	29
E1	Ardenvoir-McCrosket	3,646
E2	Huckleberry-Ardenvoir	14,694
E3	Divers-Brickel	13,410
E4	Brickle-Rubbleland	12,774
Hb3	Huckleberry-Ardenvoir 20-25%	369
Ma2	Ardenvoir-Hucklebery	3,464
Mc1	McCrosket-Ardenvoir	1,909
Mc2	McCrosket-Tokoa	598
10	Alluvial-Colluvial	964
21	Ardenvoir-Huckleberry 0-20%	374
23	Ardenvoir-Huckleberry-Molly	19,111
25	Ardenvoir-McCrosket-Tekoa	4,775
25M	Andic xerochrepts-Helmer-Molly	910
25G	Graveson-Molly-Spokel-Suttler	1,203
43	Divers-Dorb-Brickel	25,074
47M	Nakarna-Molly	559
73	Rock outcrop-Brikel-Divers	133
81	Rock outcrop-Ardenvoir-Huckleberry	14,353
91	Rock oucrop-Bluesprin-Riggens	336
	TOTAL	271,425

SOURCE: BLM, Coeur d'Alene District, 1980.

APPENDIX 3-2

SIGNIFICANT OR SPECIAL
TERRESTRIAL VERTEBRATES

A list of terrestrial vertebrates that would most likely be affected by timber harvest and associated activities in the EIS study area or that have special status was developed in Table A. The list is limited to those species normally associated with forested areas and excludes numerous species found in agricultural areas, grasslands, etc. This list was further limited by testing each species against criteria of significance (modified from Jackson-Klamath Draft ES 1979). The criteria of significance are:

1. Endangered, threatened, or special status.
2. Dependence on mature or old growth timber for part of their life cycle.
3. Dependence on snags or dead-top trees for part of their life cycle.
4. Dependence on early seral stages for part of their life cycle.
5. Species of limited range.
6. Recreational or commercial importance.
7. Limited versatility (adaptability).

The list was prepared from information contained in many published sources (Bernard and Brown 1977; Burt and Grossenherder 1964; Call 1979; Robbins, et al. 1966; Stebbins 1966; Thomas, editor 1979; Wilson 1975). Selections of species of limited versatility were based on information in the Forest Service Agricultural Handbook No. 553, 1979. Species meeting one or more of the criteria are also listed in Table A. The use of seral stages was also adapted from the Agricultural Handbook. Information displayed in other columns may be based on the subjective opinion of persons knowledgeable with Bureau lands in the district.

This appendix also contains a list of endangered, threatened, and sensitive species found in north Idaho (Table B).

APPENDIX 3-2, TABLE A
KEY

* = Cavity User
? = Unknown

Population Status

I = Increase
S = Stable
D = Decrease

Criteria of Significance

1 = Threatened, endangered or sensitive
2 = Mature or old growth dependent
3 = Snag dependent
4 = Early seral stage dependent
5 = Species of limited range
6 = Recreational or commercial value
7 = Species of low versatility indices

Vegetation Zone

D = Douglas fir-Ponderosa Pine
M = Pachistima-mixed forest
S = Subalpine
A = All

Relative Abundance

A = Abundant
C = Common
U = Uncommon

Resident

P = Permanent
B = Breeding
M = Migrant

Habitat Quality

P = Poor
F = Fair
G = Good

Habitat Quantity

I = Increase
S = Stable
D = Decrease

Seral Stage

O = Feeding
X = Breeding

APPENDIX 3-2, TABLE A

SELECTED TERRESTRIAL VERTEBRATES
OF BLM LANDS IN NORTH IDAHO

Species	Vegetative Zone	Resident	Grassy Forb	Brush/ Seedling	Pole/Sapling	Young 2nd Growth	Mature	Old Growth	Criteria of Significance	Population Status	Relative Abundance	Habitat Quality	Habitat Quantity
Wood Frog *Rana sylvatica*	M	P	OX	--	--	--	OX	OX	1,5	?	U	?	?
Northern Rough-Skinned Newt *Taricha granulosa*	DM	P	OX	OX	OX	OX	OX	OX	1,5	?	U	?	?
Painted turtle *Chrysemys picta*	M	P	OX	OX	OX	OX	OX	OX	1,5	S	U	G	S
Preble's Shrew *Sorex preblii*	DM	P	OX	OX	OX	OX	OX	OX	1	?	U	?	?
Pygmy Shrew *Microsorex hoyi*	M	P	OX	--	--	OX	OX	OX	1,5	?	U	?	?
*Little Brown Myotis *Myotis lucifugis*	A	B	0	0	0	0	OX	OX	2,3	?	?	?	?
*Long-eared Myotis *Myotis evotis*	A	B	0	0	0	0	OX	OX	2,3	?	?	?	?
*California Myotis *Myotis californicus*	A	B	0	0	--	--	OX	OX	2,3	?	?	?	?
*Silver-haired Bat *Lasionycteris noctivagans*	A	B	0	0	0	0	OX	OX	2,3	?	?	?	?
*Big Brown Bat *Eptesicus fuscus*	A	B	0	0	0	0	OX	OX	2,3	?	?	?	?
Black Bear *Ursus americanus*	A	P	0	OX	OX	OX	OX	OX	6	S	C	FG	S
Grizzly Bear *Ursus arctos*	S	P	0	OX	OX	OX	OX	OX	1,5	D	U	F	D
*Pine Martin *Martes americana*	MS	P	--	--	0	0	OX	OX	2,3	D	U	PG	D

APPENDIX 3-2, TABLE A (Cont.)

SELECTED TERRESTRIAL VERTEBRATES
OF BLM LANDS IN NORTH IDAHO

Species	Vegetative Zone	Resident	Grassy Forb	Brush/ Seedling	Pole/Sapling	Young 2nd Growth	Mature	Old Growth	Criteria of Significance	Population Status	Relative Abundance	Habitat Quality	Habitat Quantity
*Fisher *Martes pennanti*	MS	P	--	--	0	0	0X	0X	1,2,3	D	U	PG	D
Wolverine *Gulo gulo*	MS	P	0	0X	0X	0X	0X	0X	1,5	D	U	PG	D
River Otter *Lutra canadensis*	DM	P	0X	0X	0X	0X	0X	0X	1,7	S	U	G	S
Rocky Mountain Wolf *Canis lupis irremotus*	M	?	0	0	0X	0X	0X	0X	1,5	?	U	F	?
Mountain Lion *Felis concolor*	A	P	0	0X	0X	0X	0X	0X	6	I	C	G	S
Bobcat *Felis rufus*	A	P	0	0X	0X	0X	0X	0X	1	S	U	PF	S
Canada Lynx *Felis lynx*	A	P	0	0X	0X	0X	0X	0X	1	D	U	PG	D
*Northern Flying Squirrel *Glaucomys sabrina*	DM	P	--	--	--	--	0X	0X	2,3	S	U	F	D
Northern Bog Lemming *Synaptomys borealis*	S	P	0X	0	0	--	--	--	4	?	U	G	S
Heather vole *Phenacomys intermedius*	MS	P	0X	0X	--	--	--	0X	7	?	?	G	S
Woodland Caribou *Rangifer tarandus*	MS	M	--	--	--	--	0	0	1	D	U	G	D
Elk *Cervus elaphus*	A	P	0	0X	0X	0	0	0	6	D	C	PG	D
Mule deer *Odocoileus hemionus*	A	P	0X	0X	0X	0	0	0	6	D	C	PG	D

APPENDIX 3-2, TABLE A (Cont.)

SELECTED TERRESTRIAL VERTEBRATES
OF BLM LANDS IN NORTH IDAHO

Species	Vegetative Zone	Resident	Grassy Forb	Brush/ Seedling	Pole/Sapling	Young 2nd Growth	Mature	Old Growth	Criteria of Significance	Population Status	Relative Abundance	Habitat Quality	Habitat Quantity
White-tailed deer Odocoileus irginianus	A	P	OX	OX	OX	OX	0	0	6	S	C	G	S
Moose Alces alces	A	P	OX	OX	0	0	--	--	6	S	C	FG	S
Great Blue Heron Ardea herodias	DM	P	0	--	--	--	X	--	2,7	S	C	G	S
*Wood Duck Aix sponsa	DM	B	0	0	0	0	OX	OX	3	S	U	F	S
Goshawk Accipiter gentilis	DM	P	--	0	--	0	OX	OX	2,7	D	U	FG	D
Cooper's Hawk Accipiter cooperii	DM	0	0	0	0	OX	OX	0	2	D	U	FG	D
Bald Eagle Haliaeetus leucocephalus	DM	-	0	0	0	0	OX	OX	1,2	S	U	PG	S
Golden Eagle Aquila chrysaetos	DM	B	0	0	0	0	OX	OX	2,3	S	U	FG	S
Osprey Pandion haliaetus	DM	B	0	0	0	0	OX	OX	1,2,3	S	A	FE	S
Gyrfalcon Falco rusticolus	DM	M	0	0	0	0	--	--	1	?	U	G	?
Merlin Falco columbarius	DM	B	0	0	0	0	OX	OX	2,3	S	U	F	D
*Kestrel Falco sparverius	DM	B	0	0	--	X	X	OX	3	S	C	G	D
Merriam's Wild Turkey Meleagris gallopavo merriami	D	P	0	OX	X	X	0	0	4,6	SI	U	PG	I
Blue Grouse Dendragapus obscurus	M	P	0	OX	OX	0	0	0	4,6	S	A	F	I

APPENDIX 3-2, TABLE A (Cont.)

SELECTED TERRESTRIAL VERTEBRATES OF BLM LANDS IN NORTH IDAHO

Species	Vegetative Zone	Resident	Grassy Forb	Brush/ Seedling	Pole/Sapling	Young 2nd Growth	Mature	Old Growth	Criteria of Significance	Population Status	Relative Abundance	Habitat Quality	Habitat Quantity
Richardson's Blue Grouse *Dendragapus obscurus richardsonii*	M	P	O	OX	OX	O	O	O	1,4	?	?	F	I
Spruce Grouse *Canachites canadensis*	MS	P	--	O	OX	OX	OX	O	6,7	S	C	FG	S
Ruffed Grouse *Bonasa umbellus*	M	P	--	OX	X	O	OX	OX	6	S	A	GE	S
*Screech Owl *Otus asio*	DM	P	O	O	--	X	OX	OX	7	?	U	FG	D
*Flammulated Owl *Otus flammeolus*	D	B	O	O	--	X	OX	OX	7	?	U	FG	D
Great Horned Owl *Bubo virginianus*	DM	P	O	O	O	OX	OX	OX	7	?	C	F	D
*Pygmy Owl *Glaucidium gnoma*	DM	P	O	O	O	OX	OX	OX	3	?	C	F	D
Great Grey Owl *Strix nebulosa*	DM	P	O	--	--	O	X	X	2,7	?	U	F	D
Long-eared Owl *Asio otus*	DM	P	O	O	O	OX	OX	OX	7	?	U	F	D
*Saw-Whet Owl *Aegolius acadius*	DM	P	--	--	--	X	OX	OX	2	?	U	F	D
*Vaux's Swift *Chaetura vauxi*	DM	B	--	--	--	--	OX	OX	2,7	D	U	F	D
Broad-tailed hummingbird *Selasphorus platycercus*	D	B	O	OX	OX	--	--	--	4,7	?	C	G	I
Townsend's Warbler *Dendroica townsendii*	DM	B	--	--	--	O	OX	OX	2,7	?	C	FG	D

APPENDIX 3-2, TABLE A (Cont.)

SELECTED TERRESTRIAL VERTEBRATES
OF BLM LANDS IN NORTH IDAHO

Species	Vegetative Zone	Resident	Grassy Forb	Brush/ Seedling	Pole/Sapline	Young 2nd Growth	Mature	Old Growth	Criteria of Significance	Population Status	Relative Abundance	Habitat Quality	Habitat Quantity
Red Crosbill Loxia curvirostra	A	B	--	--	--	0	OX	OX	2,7	?	C	FG	D
*Pileated Woodpecker Dryocapus pileatus	DM	P	--	--	--	--	OX	OX	2,3,7	D	C	FG	D
*Lewis Woodpecker Asyndesmus lewis	DM	B	0	0	--	OX	OX	OX	3,7	D	U	FG	D
*Yellow-Bellied Sapsucker Sphyrapicus varius	DM	B	--	--	--	OX	OX	--	2,3,7	S	C	G	S
*Williamson's Sapsucker Sphyrapicus thyroideus	D	B	--	--	--	--	OX	OX	2,3,7	?	U	FG	D
*Hairy Woodpecker Dendrocopus villosus	DM	P	--	--	--	OX	OX	OX	3,7	S	C	FG	D
*Downy Woodpecker Dendrocopus pubescens	DM	P	--	--	--	OX	OX	OX	3,7	S	C	FG	D
*White-headed Woodpecker Dendrocopus albolarvatus	DM	P	--	--	--	--	OX	OX	2,3,7	?	U	F	D
*Black-Backed Three-Toed Woodpecker Picoides articus	DM	P	--	--	--	OX	OX	OX	3,7	D	U	FG	D
*Northern Three-Toed Woodpecker Picoides tridactylus	DM	P	--	--	--	OX	OX	OX	3,7	D	U	F	D
*Tree Swallow Iredoprocne bicolor	A	B	0	0	--	X	X	OX	3,7	S	C	FG	D
Clark's Nutcracker Nucifraga columbiana	A	P	--	--	--	0	OX	OX	2,7	?	V	F	D
*Boreal Chickadee Parus hudsonicus	MS	P	--	--	OX	OX	OX	OX	1	?	U	?	S

APPENDIX 3-2, TABLE A (Cont.)

SELECTED TERRESTRIAL VERTEBRATES
OF BLM LANDS IN NORTH IDAHO

Species	Vegetative Zone	Resident	Grassy Forb	Brush/ Seedling	Pole/Sapling	Young 2nd Growth	Mature	Old Growth	Criteria of Significance	Population Status	Relative Abundance	Habitat Quality	Habitat Quantity
*White-Breasted Nuthatch _Sitta carolinensis_	A	P	--	--	--	--	OX	OX	2,3,7	D	C	FG	D
*Red-Breasted Nuthatch _Sitta canadensis_	A	P	--	--	--	OX	OX	OX	3,7	D	C	FG	D
*Pygmy Nuthatch _Sitta pygmaea_	A	P	--	--	--	--	OX	OX	2,3,7	D	U	FG	D
*Brown Creeper _Certhia familiaris_	A	P	--	--	--	0	OX	OX	2,3,7	D	C	FG	D
*Western Bluebird _Sialia mexicana_	A	B	0	0	--	OX	OX	OX	3	S	U	F	D
*Mountain Bluebird _Sialia currucoides_	A	B	0	0	--	OX	OX	OX	3	S	C	F	D
Ruby-crowned Kinglet _Regulus calendula_	A	B	--	--	0	0	OX	OX	2	D	C	FG	D

APPENDIX 3-2, TABLE B

ENDANGERED, THREATENED, AND SENSITIVE SPECIES IN NORTHERN IDAHO

Species	Status
Bald Eagle *Haliaeetus leucocephalus*	Endangered
Peregrine Falcon *Falco peregrinus*	Endangered
Rocky Mountain Wolf *Canis lupis irremotus*	Endangered
Grizzly Bear *Ursus arctos*	Threatened
Northern Rough-Skinned Newt *Taricha granulosa*	Sensitive
Wood Frog *Rana sylvatica*	Sensitive
Painted Turtle *Chrysemes picta*	Sensitive
Pygmy Shrew *Microsorex hoyi*	Sensitive
Preble's Shrew *Sorex preblii*	Sensitive
River Otter *Lutra canadensis*	Sensitive
Wolverine *Gulo gulo*	Sensitive
Canada Lynx *Felis lynx*	Sensitive
Bobcat *Felis rufus*	Sensitive

APPENDIX 3-2, TABLE B (Cont.)

ENDANGERED, THREATENED, AND SENSITIVE SPECIES IN NORTHERN IDAHO

Species	Status
Woodland Caribou *Rangifer tarandus*	Sensitive
Osprey *Pandion haliaetus*	Sensitive
Gyrfalcon *Falco rusticolus*	Sensitive
Merlin *Falco columbarius*	Sensitive
Richardson's Blue Grouse *Dendragapus obscurus richardsonii*	Sensitive
Sharp-Tailed Grouse *Pedioecetes phasianellus*	Sensitive
Mountain Quail *Oreortyx pictus*	Sensitive
Boreal Chickadee *Parus hudsonicus*	Sensitive

APPENDIX 3-3

CULTURAL RESOURCE INVENTORY METHODOLOGY

A Class II inventory of the EIS area has been conducted over a period of the last 3 years. A field examination of a sample of the area was conducted. The survey strategy used to inventory the EIS area was tailored to fit the scattered land ownership of the district. Therefore, the survey was designed to encompass the entire area.

Several sampling survey methods employed in other EIS areas were not applicable in this situation. A stratified sampling technique was not applicable since there was insufficient prior knowledge of the variance of the cultural resource values in the district to delineate meaningful strata. The wide variety of cultural resource values precluded generalizing a sampling scheme based on a particular culture group. For example, the occupation and utilization pattern of the Coeur d'Alene Indians differed from that of the pioneer gold miners who later occupied the same general region. The scattered land pattern made strata based on topographic features impractical. For instance, a survey designed to sample areas from five strata varying from valley bottoms to ridge tops might not include BLM land in every strata from which to draw a sample. Statistically, a stratified sample design is preferred to a random sample in that it allows the researcher to have more confidence in fewer samples. This is true only if the strata really exist in the population and an approximate variance of the data within the strata is known. Neither was known to be true in the EIS area.

A stratified sample was not practical for the area, yet a systematic rather than intuitive sampling procedure was desired. Therefore, a random cluster sampling procedure was chosen.

A wide variety of sites are represented in the EIS area ranging from permanent winter village sites, upland campsites, rock art, cabins, remnants of extensive mining, and logging activities.

APPENDIX 4-1

AIR QUALITY IMPACT ASSESSMENT ASSUMPTIONS AND METHODOLOGY

To assess the impacts on air quality, it has been assumed that impacts would be distributed between the air quality control regions in proportion to the BLM forest land base within those regions. In doing the analyses, two calculation methods have been used: 1) employing methods and values used by the Idaho Department of Health and Welfare (IDHW) in the State Implementation Plan (SIP) (IDHW 1980), and 2) using similar methodology with BLM estimated values and data. The IDHW method provides compatible comparisons to the SIP values.

Primary sources of particulate air pollution in Idaho are categorized in miscellaneous area sources including unpaved roads and fires. These miscellaneous area sources account for 99.5 percent of the total particulates. Unpaved roads (60.2%) are the major source, followed by wildfire (20.0%), agriculture (17.7%), and prescribed fires, including slash burning (1.7%) (IDHW 1980). Our timber managment activities contribute to the unpaved road and prescribed fire totals.

Dust from unpaved roads results from the pulverizing and lifting action of vehicle tires and strong air currents caused by the vehicles. Theoretically, dust particle drift distance is a function of particle diameter and windspeed. Particles larger than 100 microns are likely to settle out within 20 feet to 30 feet. Settling is impeded for particles from 30 microns to 100 microns in diameter resulting in their settling within a few hundred feet. Those smaller than 30 microns have much slower gravitational velocities. Settling of these particles can be retarded by atmospheric turbulence, and they may remain suspended indefinitely. These small particles (less than 30 microns) are reported as emissions.

Dust emissions are estimated by an empirical expression of the emission per vehicle mile as a function of road silt content, average vehicle speed, and days with measurable rainfall (EPA 1979). Both the IDHW method and BLM estimates use the Environmental Protetion Agency's (EPA) AP-42 procedures except that BLM estimates are based on Supplement No. 8. of AP-42 (1978). Bureau of Land Management estimates were based on the assumptions that the silt content of gravel and dirt roads is 12 percent and 75 percent, respectively, and vehicle speeds average 20 mph. Both analyses use an estimate of vehicle use in vehicle miles on the road systems and equivalent mileage per million board feet harvested.

Although emissions from burning are highly variable and consist of many combustion products and compounds, only particulates were quantified in the State Implementation Plan. Differences in fuel types, field conditions, burning techniques, and fire behavior cause wide variations in emission patterns; consequently, no single value for a given effluent can be completely representative.

A range of expected emissions is presented in Table A for major effluent components. Over 90 percent of the effluent mass is carbon dioxide and water vapor which are not normally considered pollutants. Emissions of sulfur dioxide, an important air quality parameter, are considered to be negligible because sulfur content of forest fuels is low when compared to most other carbonaceous fuels (EPA 1978b, FS 1976). The Idaho SIP also indicates that particulate emissions from burning are of major concern.

Particulate emissions from burning are estimated using emission factors per amount of fuel burned. The Idaho SIP was calculated using an emission factor of 50 pounds of particulates per ton of fuel and a fuel estimate of 65 tons per acre (Ward et al. 1976). Bureau of Land Management estimates used the same emission factor. Fuel estimates of 35 tons per acre for slash burning were obtained using data from the EPA (1978b) and local conditions. For site preparation burning, a fuel loading estimate of 25 tons per acre was used (Martin et al. 1979). For the analyses, the acres proposed for slash and site preparation burning were used to compute particulate emissions compared by alternatives in Table 4-1.

APPENDIX 4-1, TABLE A

POTENTIAL AIR QUALITY EMISSION RANGES FROM PRESCRIBED BURNING (TONS PER YEAR)

	Particulates	Carbon monoxide	Hydrocarbons	Nitrogen Oxide	Carbon Dioxide	Water
Emission Range (lb/ton of fuel)	17-67	20-500	10-40	2-6	2000-3500	500-1500
Proposed Action	240-946	282-7062	141-565	28-85	28250-49440	7063-21190
Alt. A	55-218	65-1625	33-1300	6-19	6500-11380	1625-4875
Alt. B	283-1115	330-8320	166-666	33-100	33280-58240	8320-24960
Alt. C	143-564	169-4213	84-337	17-51	16850-29490	4213-12640
Alt. D	264-1041	311-7770	155-622	31-93	31080-54390	7770-23310
Alt. E	155-611	183-4563	91-365	18-55	18250-31940	4563-13690
Idaho SIP[2]	2,726,864	692,145[1]	62,890[1]	62,234[1]	--------	--------

[1] IDHW did not include miscellaneous area sources (including burning) in these totals.

[2] Idaho State Implementation Plan (SIP) Emission Inventory Totals -- these figures represent current emission levels state-wide. They are presented here for comparison purposes.

SOURCE: EPA 1978b; IDHW 1980.

APPENDIX 4-2

IMPACTS TO WILDLIFE HABITAT

Acreage figures given the "Effect on Habitat" column of Table A are derived by determining the total amount of a species' habitat in the 3-year sample plan and projecting to the 10-year management plan. The significance of an effect of an action is described as low, moderate, or high. These are defined as follows:

- Low: Impact is minimal, affects less than 20 percent of the habitat being considered, and does not approach a threshold for that species.

- Moderate: Impact affects less than 50 percent of the habitat being considered and begins to approach a threshold for that species.

- High: Impact affects more than 50 percent of the habitat under consideration or exceeds a threshold for that species.

A threshold is the maximum amount of habitat that will be affected by an action or combination of actions. A threshold is set by policy, interest groups, or the biologist. The 50 percent figure in the significance definition is an arbitrary threshold set by the biologist. Another example of a threshold is given in a footnote at the bottom of Table A of Appendix 2-3. The comments section of Appendix 4-2, Table A lists explanations for information contained in other sections. If an impact has a duration greater than 10 years, the percentage by which the habitat is changed, improved, or degraded is given.

APPENDIX 4-2, TABLE A

IMPACTS TO WILDLIFE HABITAT

ELK
PROPOSED ACTION

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 561 acres of habitat.	Adverse. 10-20 years on 330 acres. 20+ years on 231 acres.	Low	Removal of surface vegetation, surface compaction, steepness of cut and fill eliminates an estimated 30 foot width (3.6 acres/mile) of habitat. Non-used roads will partially regenerate in 10-20 years. The total is a 0.7% reduction of elk habitat in the land proposed for timber management.
2. Use of Roads	Initial disturbance, decreased use of adjacent areas.	Adverse. Duration of road construction and timber sale. 5 years.	Low	Road construction and timber sale activities change the local distribution of elk with a net decrease in use of the area (Lyon 1979).
	Continued Use. A 1% average estimated decrease in potential use.	Adverse 20+ years	Low	Continued vehicular use by administrators, ORVs, hunters, and others decreases big game use of adjacent habitat (Perry and Overly 1977; Hershey and Leege 1975). The effect is calculated using the Elk Coordinating guidelines (See Appendix 2-3).
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 533 acres of summer range.	Neutral	Low	Clearcutting increases forage (Patton 1974); however, (Lyon 1976) found that openings were not clearly beneficial to elk, nor small openings detrimental.
	Increase browse on 100 acres of winter range.	Beneficial 10-20 years	Low	Clearcutting increases browse production. This is 0.3% of winter range on timber management lands that could be improved.
Partial Cut	Slight increase forage, decrease cover on 9,713 acres.	Adverse 10-20 years	Low	Partial cuts slightly increase forage. The decrease of cover outweighs the forage increase. Thus, a slight decrease of quality on 12% of elk habitat in timber management (see Cover/Forage in this table).
Commercial Thin	No quantifiable change.	Neutral	None	There would be avoidance during the activity.
4. Cover/Forage Ratio Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	Changing cover/forage ratios in various habitat types would have adverse or beneficial effects depending on the size of cutting units, harvest method, and availability of security cover. The impact was calculated using the Elk Coordinating Guidelines (see Appendix 2-3).
5. Slash Disposal:				
Pile & Burn	Not quantifiable	Neutral	None	---
Lop & Scatter	Slight decrease of availability of forage on 8,993 acres.	Adverse 2-5 years	Low	Elk movement may be hindered if slash depths exceed 18 inches.
Burn in Place	Increase in forage on 533 acres of summer range and browse on 100 acres of winter range.	Beneficial 10-20 years	Low	Proposed burns would occur on clearcuts. Burns on clearcuts can increase forage 500 or more pounds per acre.
6. Site Preparation:				
Mechanical Scarification	Decrease of forage on 339 acres.	Adverse 5-10 years	Low	Scarification removes browse and forage plant species. This is 0.4% of elk habitat on the land proposed for timber management.
Burn	Increase of forage on 1,276 acres.	Beneficial 10-20 years	Low	See Burn in place comments. This is an improvement in forage production on 1.6% of elk habitat on the timber management lands.

APPENDIX 4-2, TABLE A(Cont.)

IMPACTS TO WILDLIFE HABITAT

ELK
PROPOSED ACTION (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
7. Planting	Decrease the duration of forage production on 2,207 acres.	Adverse	Low	This is essentially the converse of timber harvest. Both the decrease in forage and increase in cover begin 10-15 years from time of planting and continue until harvest.
	Increase cover on 2,207 acres.	Neutral	Low	---
8. Precommercial Thin and Sanitation Thin	None quantifiable	Neutral	None	Precommercial thin usually will not open canopy enough to increase forage or remove stems enough to decrease cover. There would be avoidance of the area during activity.
9. Fertilization	Increase vigor of forage on 2413 acres.	Beneficial 1-3 years	Low	Fertilization increases the vigor of forbs, grasses, and shrubs.

ELK
ALTERNATIVE A

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 129 acres of habitat.	Adverse. 10-20 years on 76 acres. 20+ years on 53 acres.	Low	Same impacts as discussed under proposed action. A 0.7% reduction of elk habitat in the land proposed for timber management.
2. Use of Roads	Initial disturbance.	Adverse 5 years	Low	Same as proposed action.
	Continued use. A <1% average estimated decrease in potential use.	Adverse 20+ years	Low	
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 123 acres of summer range.	Neutral	Low	Same as proposed action.

ELK
ALTERNATIVE A (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
	Increase browse on 22 acres of winter range.	Beneficial 10-20 years	Low	This is 0.3% of winter range on timber management land that could be improved.
Partial Cut	Slight increase of forage, decrease cover on 2,118 acres.	Adverse 10-20 years	Low	A slight decrease on 11% of elk habitat in timber management.
Commercial Thin	No quantifiable change.	Neutral	None	Same impact as proposed action.
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	See comments for proposed action.
5. Slash Disposal:				
Pile & Burn	Not quantifiable.	Neutral	None	
Lop & Scatter	Slight decrease of forage availability on 2,068 acres.	Adverse 2-5 years	Low	See comments for proposed action.
Burn in Place	Increase forage on 123 summer range acres. Browse on 22 acres of winter range.	Beneficial 10-20 years	Low	See comments for proposed action.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 78 acres.	Adverse 5-10 years	Low	This is 0.4% of the elk habitat on the lands proposed for timber management.
Burn	Increase forage on 294 acres.	Beneficial 10-20 years	Low	Improvement in forage production on 1.5% of elk habitat on the timber management lands.
7. Planting	Increase duration of forage on 507 acres. Increase cover.	Neutral	Low	Same impacts as proposed action.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

ELK
ALTERNATIVE A (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
8. Precommercial Thin and Sanitation Thin	None quantifiable.	Neutral	None	Same as proposed action.
9. Fertilization	Increase forage vigor on 556 acres.	Beneficial 1-3 years	Low	Same as proposed action.

ELK
ALTERNATIVE B

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 662 acres of habitat.	Adverse 10-20 years on 390 acres. 20+ years on 272 acres	Low	Same impacts as discussed under proposed action. A 0.8% reduction of elk habitat in the lands proposed for timber management.
2. Use of Roads	Initial disturbance.	Adverse 5 years	Low	Same as proposed action.
	Continued use. A 1 - 2% average estimated decrease in potential use.	Adverse 20+ years	Low	
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 630 acres of summer range.	Neutral	Low	Same as proposed action.
	Increase browse on 112 acres of winter range.	Beneficial 10-20 years	Low	This is 0.3% of winter range on timber management lands that could be improved.
Partial Cut	Slight increase of forage, decrease cover on 11,117 acres.	Adverse 10-20 years	Low	A slight decrease on 13% of elk habitat in timber management.
Commercial Thin	No quantifiable change.	Neutral	None	Same impact as proposed action.

ELK
ALTERNATIVE B (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.6% increase in potential use.	Neutral	Low	See comments for proposed action.
5. Slash Disposal:				
Pile & Burn	Not quantifiable.	Neutral	None	
Lop & Scatter	Slight decrease of forage availability on 10,612 acres.	Adverse 2-5 years	Low	See comments for proposed action.
Burn in Place	Increase forage on 630 summer range acres. Browse on 112 acres of winter range.	Beneficial 10-20 years	Low	See comments for proposed action.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 400 acres.	Adverse 5-10 years	Low	This is 0.5% of elk habitat on the lands proposed for timber management.
Burn	Increase forage on 1,505 acres.	Beneficial 10-20 years	Low	Improvement in forage production on 1.7% of elk habitat on the timber management lands.
7. Planting	Decrease duration of forage on 2,603 acres. Increase cover.	Neutral	Low	Same impacts as proposed action.
8. Precommercial Thin and Sanitation Thin	None quantifiable.	Neutral	None	Same as proposed action.
9. Fertilization	Increase forage vigor on 2,848 acres.	Beneficial 1-3 years	Low	Same as proposed action.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

ELK
ALTERNATIVE C

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 611 acres of habitat.	Adverse 10-20 years on 144 acres. 20+ years on 467 acres	Low	Same impacts as discussed under proposed action. A 0.7% reduction of elk habitat in the lands proposed for timber management.
2. Use of Roads	Initial disturbance.	Adverse 5 years	Low	Same as proposed action.
	Continued use. A 2% average estimated decrease in potential use.	Adverse 20+ years	Low	
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 1,877 acres of summer range.	Neutral	Low	Same as proposed action.
	Increase browse on 334 acres of winter range.	Beneficial 10-20 years	Low	This is 0.9% of winter range on timber management lands that could be improved.
Partial Cut	Slight increase of forage, decrease cover on 8,348 acres.	Adverse 10-20 years	Low	A slight decrease on 9.9% of elk habitat in timber management.
Commercial Thin	No quantifiable change.	Neutral	None	Same impact as proposed action.
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 0.9% increase in potential use.	Neutral	Low	See comments for proposed action.
5. Slash Disposal:				
Pile & Burn	Not quantifiable.	Neutral	None	
Lop & Scatter	Slight decrease of forage availability on 6,266 acres.	Adverse 2-5 years	Low	See comments for proposed action.

ELK
ALTERNATIVE C (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
Burn in Place	Increase forage on 1,877 summer range acres. Browse on 334 acres of winter range.	Beneficial 10-20 years	Low	See comments for proposed action.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 39 acres.	Adverse 5-10 years	Low	
Burn	Increase forage on 9 acres.	Beneficial 10-20 years	Low	
7. Planting	Decrease duration of forage on 954 acres. Increase cover.	Neutral	Low	Same impacts as proposed action.
8. Precommercial Thin and Sanitation Thin	None quantifiable.	Neutral	None	Same as proposed action.
9. Fertilization	No fertilization proposed.			

ELK
ALTERNATIVE D

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 617 acres of habitat.	Adverse 10-20 years on 363 acres. 20+ years on 254 acres	Low	Same impacts as discussed under proposed action. A 0.8% reduction of elk habitat in the lands proposed for timber management.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

ELK
ALTERNATIVE D (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
2. Use of Roads	Initial disturbance.	Adverse 5 years	Low	Same as proposed action.
	Continued use. A 1.2% average estimated decrease in potential use.	Adverse 20+ years	Low	
3. Cutting Practices: Clearcut	Increase forage, decrease cover on 587 acres of summer range.	Neutral	Low	Same as proposed action.
	Increase browse on 104 acres of winter range.	Beneficial 10-20 years	Low	This is 0.3% of winter range on timber management lands that could be improved.
Partial Cut	Slight increase of forage, decrease cover on 16,347 acres.	Adverse 10-20 years	Low	A slight decrease on 2.1% of elk habitat in timber management.
Commercial Thin	No quantifiable change.	Neutral	None	Same impact as proposed action.
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	See comments for proposed action.
5. Slash Disposal: Pile & Burn	Not quantifiable.	Neutral	None	
Lop & Scatter	Slight decrease of forage availability on 9,892 acres.	Adverse 2-5 years	Low	See comments for proposed action.
Burn in Place	Increase forage on 587 summer range acres. Browse on 104 acres of winter range.	Beneficial 10-20 years	Low	See comments for proposed action.

ELK
ALTERNATIVE D (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
6. Site Preparation: Mechanical Scarification	Decrease forage on 372 acres.	Adverse 5-10 years	Low	This is 0.5% of elk habitat on the proposed timber management land.
Burn	Increase forage on 1,404 acres.	Beneficial 10-20 years	Low	Improvement in forage production on 1.7% of elk habitat on the timber management land.
7. Planting	Decrease duration of forage on 2,427 acres. Increase cover.	Neutral	Low	Same impacts as proposed action.
8. Precommercial Thin and Sanitation Thin	None quantifiable.	Neutral	None	Same as proposed action.
9. Fertilization	Increase forage vigor on 2,655 acres.	Beneficial 1-3 years	Low	Same as proposed action.

ELK
ALTERNATIVE E

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill.	Loss of 418 acres of habitat.	Adverse. 10-20 years on 201 acres. 20+ years on 217 acres	Low	Same impacts as discussed under proposed action. A 0.6% reduction of elk habitat in the land proposed for timber management.
2. Use of Roads	Initial disturbance.	Adverse 5 years	Low	Same as proposed action.
	Continued use. A 1% average estimated decrease in potential use.	Adverse 20+ years	Low	

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

ELK
ALTERNATIVE E (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 405 acres of summer range.	Neutral	Low	Same as proposed action.
	Increase browse on 72 acres of winter range.	Beneficial 10-20 years	Low	This is 0.3% of winter range on timber management lands that could be improved.
Partial Cut	Slight increase of forage, decrease cover on 10,876 acres.	Adverse 10-20 years	Low	A slight decrease on 16% of elk habitat in timber management.
Commercial Thin	No quantifiable change.	Neutral	None	Same impact as proposed action.
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	See comments for proposed action.
5. Slash Disposal:				
Pile & Burn	Not quantifiable.	Neutral	None	
Lop & Scatter	Slight decrease of forage availability on 7,153 acres.	Adverse 2-5 years	Low	See comments for proposed action.
Burn In Place	Increase forage on 405 summer range acres. Browse on 72 acres of winter range.	Beneficial 10-20 years	Low	See comments for proposed action.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 275 acres.	Adverse 5-10 years	Low	This is 0.4% of elk habitat on the lands proposed for timber management.
Burn	Increase forage on 853 acres.	Beneficial 10-20 years	Low	Improvement in forage production on 1.2% of elk habitat on the timber management lands.

ELK
ALTERNATIVE E (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
7. Planting	Decrease duration of forage on 1,485 acres. Increase cover.	Neutral	Low	Same impacts as proposed action.
8. Precommercial Thin and Sanitation Thin	None quantifiable.	Neutral	None	Same as proposed action.
9. Fertilization	Increase forage vigor on 1,984 acres.	Beneficial 1-3 years	Low	Same as proposed action.

WHITE-TAILED DEER
PROPOSED ACTION

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 393 acres of habitat.	Adverse	Low	See the comments on elk habitat, proposed action. This is a 0.7% reduction of white-tailed deer habitat on the lands proposed for timber management.
2. Use of Roads	Initial disturbance, decreased use of adjacent areas.	Adverse Duration of road construction and timber sale. 5 years.	Low	White-tailed deer will avoid human activity; however, on deer winter range, deer may be attracted to green slash materials on an active sale.
	Continued Use. A <1% average estimated decrease in potential use.	Adverse 20+ years	Low	White-tailed deer are susceptible to road hunting. Increased access would increase hunter opportunity to the detriment of the deer population of the local area.
3. Cutting Practices:				
Clearcut	Forage increased.	Neutral	Low	White-tailed deer use of clearcuts does not appreciably increase over uncut (Edgerton 1972). Buffers and small size of clearcuts would protect the deer from hunting pressure.
Partial Cut	Slight increase in forage.	Neutral	Low	Deer use of partial cuts is also not appreciably increased, or decreased (Edgerton 1972).

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

WHITE-TAILED DEER
PROPOSED ACTION (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
Commercial Thin	None quantifiable	Neutral	None	There is no significant difference in deer forage productivity between thinned and unthinned stands (Marsh 1954).
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	See comments under proposed action analysis summary for elk. The same impact estimate is used assuming, however, that deer are probably less affected than elk.
5. Slash Disposal:				
Pile & Burn	Not quantifiable	Neutral	None	---
Lop and Scatter	Slight decrease in forage availability on 6,304 acres.	Neutral 2-5 years	Low	Slash may hinder deer movement. Green slash would be used as forage if harvest is during winter months.
Burn in Place	Forage increase.	Neutral	Low	See clearcuts, this section.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 237 acres.	Adverse 5-10 years	Low	Scarification removes forage plant species. This is 0.4% of white-tailed deer habitat on the proposed timber management land.
Burn	Increase forage.	Neutral	Low	Burns increase forage, however, deer use would probably not increase significantly.
7. Planting	None anticipated.	Neutral	None	Planting would probably not affect white-tailed deer to any extent.
8. Precommercial Thin and Sanitation Thin	None	Neutral	None	See commercial thinning.
9. Fertilization	Increase forage vigor on 1,692 acres.	Beneficial 1-3 years	Low	

WHITE-TAILED DEER
ALTERNATIVE A

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 91 acres of habitat.	Adverse	Low	This is a 0.2% decrease of white-tailed deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices	Same as proposed action.	Adverse	Low	
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	Low	
Lop and Scatter	Slight decrease in forage availability on 1,450 acres.	Neutral	Low	
Burn in Place	Forage increase.	Neutral	Low	
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 54 acres.	Adverse 5-10 years	Low	
Burn	Increase forage.	Neutral	Low	
7. Planting	None	Neutral	None	
8. Precommercial and Sanitation Thin	None	Neutral	None	
9. Fertilization	Increase forage vigor on 390 acres.	Beneficial 1-3 years	Low	

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

WHITE-TAILED DEER
ALTERNATIVE B

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 464 acres of habitat.	Adverse	Low	This is a 0.8% decrease of white-tailed deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices	Same as proposed action.	Adverse	Low	
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.6% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	Low	
Lop and Scatter	Slight decrease in forage availability on 7,439 acres.	Neutral	Low	
Burn in Place	Forage increase.	Neutral	Low	
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 280 acres.	Adverse 5-10 years	Low	
Burn	Increase forage.	Neutral	Low	
7. Planting	None	Neutral	None	
8. Precommercial and Sanitation Thin	None	Neutral	None	
9. Fertilization	Increase forage vigor on 1,996 acres.	Beneficial 1-3 years	Low	

WHITE-TAILED DEER
ALTERNATIVE C

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New roads surface, cut and fill	Loss of 428 acres of habitat.	Adverse	Low	This is a 0.7% decrease of white-tailed deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices	Same as proposed action.	Adverse	Low	
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 0.9% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	Low	
Lop and Scatter	Slight decrease in forage availability on 4,393 acres.	Neutral	Low	
Burn in Place	Forage increase.	Neutral	Low	
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 7 acres.	Adverse 5-10 years	Low	
Burn	Increase forage.	Neutral	Low	
7. Planting	None	Neutral	None	
8. Precommercial and Sanitation Thin	None	Neutral	None	
9. Fertilization	No fertilization proposed.			

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

WHITE-TAILED DEER
ALTERNATIVE D

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 433 acres of habitat.	Adverse	Low	This is a 0.8% decrease of white-tailed deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices	Same as proposed action.	Adverse	Low	
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	Low	
Lop and Scatter	Slight decrease in forage availability on 6935 acres.	Neutral	Low	
Burn in Place	Forage increase.	Neutral	Low	
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 261 acres.	Adverse 5-10 years	Low	
Burn	Increase forage.	Neutral	Low	
7. Planting	None	Neutral	None	
8. Precommercial and Sanitation Thin	None	Neutral	None	
9. Fertilization	Increase forage vigor on 1,861 acres.	Beneficial 1-3 years	Low	

WHITE-TAILED DEER
ALTERNATIVE E

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 293 acres of habitat.	Adverse	Low	This is a 0.6% decrease of white-tailed deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices	Same as proposed action.	Adverse	Low	
4. Cover/Forage Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	Low	
Lop and Scatter	Slight decrease in forage availability on 5,014 acres.	Neutral	Low	
Burn in Place	Forage increase.	Neutral	Low	
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 192 acres.	Adverse 5-10 years	Low	
Burn	Increase forage.	Neutral	Low	
7. Planting	None	Neutral	None	
8. Precommercial and Sanitation Thin	None	Neutral	None	
9. Fertilization	Increase forage vigor on 1,391 acres.	Beneficial 1-3 years	Low	

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

MULE DEER
PROPOSED ACTION

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill.	Loss of 468 acres of habitat.	Adverse	Low	See the comments in the proposed action analysis for elk. This is a 0.7% reduction in mule deer habitat on timber management land.
2. Use of Roads	Disturbance. A <1% estimated decrease in potential use.	Adverse 20+ years	Low	Continual vehicular use decreases use of adjacent habitat. The decrease in potential use is not as great as for elk (Thomas, ed. 1979).
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 480 acres.	Beneficial 10-20 years	Low	Clearcutting increases forage and can benefit mule deer (Patton 1974). The small size of the clearcuts and buffer policy ensures maximum use and adequate cover for security. This alters 0.7% of mule deer habitat on timber management land.
Partial Cut	Slight increase of forage on 12,410 acres. Decreased cover.	Adverse 10-20 years	Low	Partial cuts slightly increase forage.
Commercial Thin	No measurable change.	Neutral	Low	See comments of proposed action analysis for white-tailed deer.
4. Cover/Forage Ratio Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	See comments of proposed action analysis for elk. The same impact estimate is used.
5. Slash Disposal:				
Pile and Burn	None measurable	Neutral	None	
Lop and Scatter	Slight decrease in availability of forage for 7,510 acres.	Adverse 2-5 years	Low	
Burn in Place	Increase in forage on 480 acres.	Beneficial 10-20 years	Low	This is 0.7% of mule deer habitat on timber management lands.

MULE DEER
PROPOSED ACTION (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 283 acres.	Adverse 5-10 years	Low	This is 0.4% of mule deer habitat on timber management lands.
Burn	Increase forage on 1,065 acres.	Beneficial 5-10 years	Low	This is 1.6% of mule deer habitat on timber management lands.
7. Planting	Decrease duration of forage on 1,843 acres.	Neutral	Low	See comments in proposed action analysis for elk.
8. Precommercial Thin	None measurable.	Neutral	Low	
9. Fertilization	Increase vigor of forage on 2,015 acres.	Beneficial 1-3 years	Low	

MULE DEER
ALTERNATIVE A

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 108 acres of habitat.	Adverse	Low	See proposed action analysis. This is a 0.7% reduction of mule deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 111 acres.	Beneficial 10-20 years	Low	See proposed action analysis. This alters 0.7% of the acres of mule deer habitat on timber management land.
Partial Cut	Slight increase of forage on 2,854 acres. Decreased cover.	Neutral	Low	See proposed action analysis, white-tailed deer.
Commercial and Precommercial Sanitation Thin	None	Neutral	Low	

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

MULE DEER
ALTERNATIVE A (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
4. Cover/Forage Ratio Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	None	
Lop and Scatter	Slight decrease in availability of forage on 1,727 acres.	Adverse 2-5 years	Low	
Burn in Place	Increase in forage on 111 acres	Beneficial 10-20 years	Low	This is 0.7% of mule deer habitat on timber management lands.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 65 acres.	Adverse 5-10 years	Low	This is 0.4% of mule deer habitat on timber management lands.
Burn	Increase forage. on 245 acres.	Beneficial 5-10 years.	Low	This is 1.5% of mule deer habitat on timber management lands.
7. Planting	Decrease duration of forage on 424	Neutral	Low	
8. Precommercial Thin	None	Neutral	None	
9. Fertilization	Increase forage vigor on 464 acres.	Beneficial 1-3 years	Low	

MULE DEER
ALTERNATIVE B

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 553 acres of habitat.	Adverse	Low	See proposed action analysis. This is a 0.8% reduction of mule deer habitat on timber managemend lands.

MULE DEER
ALTERNATIVE B (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting practices:				
Clearcut	Increase forage, decrease cover on 567 acres.	Beneficial 10-20 years	Low	See proposed action analysis. This alters 0.8% of the acres of mule deer habitat on timber management land.
Partial Cut	Slight increase of forage on 15,210 acres. Decreased cover.	Neutral	Low	See proposed action analysis, white-tailed deer.
Commercial and Precommercial Sanitation Thin	None	Neutral	Low	
4. Cover/Forage Ratio Change Resulting from Cutting Practices	Estimated 1.6% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	None	
Lop and Scatter	Slight decrease in availability of forage on 8861 acres.	Adverse 2-5 years	Low	
Burn in Place	Increase in forage on 567 acres	Beneficial 10-20 years	Low	This is 0.8% of mule deer habitat on timber management lands.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 334 acres.	Adverse 5-10 years	Low	This is 0.5% of mule deer habitat on timber management lands.
Burn	Increase forage. on 1,257 acres.	Beneficial 5-10 years	Low	This is 1.7% of mule deer habitat on timber management lands.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

MULE DEER
ALTERNATIVE B (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
7. Planting	Decrease duration of forage on 2,174 acres.	Neutral	Low	
8. Precommercial Thin	None	Neutral	None	
9. Fertilization	Increase forage vigor on 2378 acres.	Beneficial 1-3 years.	Low	

MULE DEER
ALTERNATIVE C

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 510 acres of habitat.	Adverse	Low	See proposed action analysis. This is a 0.7% reduction of mule deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 1,690 acres.	Beneficial 10-20 years	Low	See proposed action analysis. This alters 2.4% of the acres of mule deer habitat on timber management land.
Partial Cut	Slight increase of forage on 6,970 acres. Decreased cover.	Neutral	Low	See proposed action analysis, white-tailed deer.
Commercial and Precommercial Sanitation Thin	None	Neutral	Low	
4. Cover/Forage Ratio Change Resulting from Cutting Practices	Estimated 0.9% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	None	

MULE DEER
ALTERNATIVE C (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
Lop and Scatter	Slight decrease in availability of forage on 5,233 acres.	Adverse 2-5 years	Low	
Burn in Place	Increase in forage on 1,458 acres	Beneficial 10-20 years	Low	This is 2.1% of mule deer habitat on timber management lands.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 8 acres.	Adverse 5-10 years	Low	
Burn	Increase forage. on 32 acres.	Beneficial 5-10 years	Low	
7. Planting	Decrease duration of forage on 797 acres.	Neutral	Low	
8. Precommercial Thin	None	Neutral	None	
9. Fertilization	No fertilization proposed.			

MULE DEER
ALTERNATIVE D

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 515 acres of habitat.	Adverse	Low	See proposed action analysis. This is a 0.8% reduction of mule deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 528 acres.	Beneficial 10-20 years	Low	See proposed action analysis. This alters 0.8% of the acres of mule deer habitat on timber management land.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

MULE DEER
ALTERNATIVE D (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
Partial Cut	Slight increase of forage on 13,651 acres. Decreased cover.	Neutral	Low	See proposed action analysis, white-tailed deer.
Commercial and Precommercial Sanitation Thin	None	Neutral	Low	
4. Cover/Forage Ratio Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	None	
Lop and Scatter	Slight decrease in availability of forage on 8,260 acres.	Adverse 2-5 years	Low	
Burn in Place	Increase in forage on 528 acres	Beneficial 10-20 years	Low	This is 0.8% of mule deer habitat on timber management lands.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 311 acres.	Adverse 5-10 years	Low	This is 0.5% of mule deer habitat on timber management lands.
Burn	Increase forage. on 1,172 acres.	Beneficial 5-10 years	Low	This is 1.8% of mule deer habitat on timber management lands.
7. Planting	Decrease duration of forage on 2,027 acres.	Neutral	Low	
8. Precommercial Thin	None	Neutral	None	
9. Fertilization	Increase forage vigor on 2,217 acres.	Beneficial 1-3 years.	Low	

MULE DEER
ALTERNATIVE E

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 349 acres of habitat.	Adverse	Low	See proposed action analysis. This is a 0.6% reduction of mule deer habitat on timber management land.
2. Use of Roads	Same as proposed action.	Adverse	Low	
3. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 365 acres.	Beneficial 10-20 years	Low	See proposed action analysis. This alters 0.6% of the acres of mule deer habitat on timber management land.
Partial Cut	Slight increase of forage on 9,083 acres. Decreased cover.	Neutral	Low	See proposed action analysis, white-tailed deer.
Commercial and Precommercial Sanitation Thin	None	Neutral	Low	
4. Cover/Forage Ratio Change Resulting from Cutting Practices	Estimated 1.5% increase in potential use.	Neutral	Low	
5. Slash Disposal:				
Pile & Burn	None	Neutral	None	
Lop and Scatter	Slight decrease in availability of forage on 5,973 acres.	Adverse 2-5 years	Low	
Burn in Place	Increase in forage on 365 acres	Beneficial 10-20 years	Low	This is 0.6% of mule deer habitat on timber management lands.
6. Site Preparation:				
Mechanical Scarification	Decrease forage on 229 acres.	Adverse 5-10 years	Low	This is 0.4% of mule deer habitat on timber management lands.
Burn	Increase forage. on 712 acres.	Beneficial 5-10 years	Low	This is 1.3% of mule deer habitat on timber management lands.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

MULE DEER
ALTERNATIVE E (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
7. Planting	Decrease duration of forage on 1,240 acres.	Neutral	Low	
8. Precommercial Thin	None	Neutral	None	
9. Fertilization	Increase forage vigor on 1,656 acres.	Beneficial 1-3 years	Low	

MOOSE
ALL ALTERNATIVES INCLUDING THE PROPOSED ACTION

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. Roads	Increase hunter access.	Adverse 20+ years	Low	Open roads would be used by hunters increasing hunter opportunity. Closed roads would not be used to any extent.
2. Timber Harvest	None	Neutral	None	Buffers, clearcut size, maintain moose habitat.
3. Slash Disposal	None	Neutral	None	
4. Forest Development Site Preparation	None	Neutral	None	Burning in clearcuts on moose winter range would increase browse available; however, very little of this practice would take place on moose winter range.
5. Planting, Precommercial Thin	None	Neutral	None	
6. Fertilization	Increase forage vigor.	Beneficial 1-3 years	None	Fertilization would increase the vigor of forage when applied on moose habitat.

BLACK BEAR
PROPOSED ACTION

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	578 acre decrease in habitat.	Adverse. 10-20 years on 340 acres. 20+ years on 238 acres.	Low	See comments for elk. This acreage is 0.7% of the bear habitat that is on the timber management lands.
2. Use of Roads	Initial disturbance, decreased use of adjacent areas.	Adverse. Duration of road construction and timber sale.	Low	Bear are sensitive to and avoid disturbance.
	Continued disturbance.	Adverse Duration of open road	Low	Bear avoid disturbance. Management policy protects important areas.
3. Cutting Practices	Minor	Neutral	Low	Cutting practice as discrete action has little impact. See slash disposal and site preparation.
4. Slash Disposal:				
Pile and Burn	Decrease forage on 3,633 acres.	Adverse 10-15 years	Low	Scarification of soil by cat piling decreases important forage species, especially in moist areas, huckleberry patches, and meadow areas. Duration is determined by type of forage area scarified. Intensity of impact is determined by the percentage of ground vegetation removed. This acreage figure is 4.5% of the bear habitat that would be in timber management.
Lop and Scatter	Decrease forage on 9,271 acres.	Adverse 1-5 years	Low	Slash would cover herbaceous vegetation until decayed. It also hinders movement.
Burn In Place	Increase forage by 593 acres.	Beneficial 2-10 years	Low	Burning increases forage production. Burns in clearcuts where huckleberries are the predominant shrub are especially beneficial and relatively long term.
5. Site Preparation:				
Mechanical Scarification	Decrease forage on 349 acres.	Adverse 10-30 years	Low	Same as slash disposal, pile and burn. This is 0.4% of the bear habitat that would be in timber management.
Burn	Increase forage on 1,315 acres.	Adverse 2-10 years	Low	Same as slash disposal, burn in place.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

BLACK BEAR
PROPOSED ACTION (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
6. Planting, Thinning	None measurable.	Neutral	None	
7. Fertilization	Increase forage vigor on 2,488 acres	Beneficial 1-3 years	Low	See comments for elk.

BLACK BEAR
ALTERNATIVE A

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	133 acre decrease in habitat.	Adverse. 10-20 years on 78 acres. 20+ years on 55 acres.	Low	See comments for elk. This acreage is 0.6% of the bear habitat that is in the timber management lands.
2. Use of Roads	Initial disturbance, decreased use of adjacent areas.	Adverse. Duration of road construction and timber sale.	Low	Bear are sensitive to and avoid disturbance.
	Continued disturbance.	Adverse Duration of open road	Low	Bear avoid disturbance. Management policy protects important areas.
3. Cutting Practices	Minor	Neutral	Low	Cutting practice as discrete action has little impact. See slash disposa and site preparation.
4. Slash Disposal:				
Pile and Burn	Decrease forage on 836 acres.	Adverse 10-30 years	Low	Scarification of soil by cat piling decreases important forage species, especially in moist areas, huckleberry patches, and meadow areas. Duration is determined by type of forage area scarified. Intensity of impact is determined by the percentage of ground vegetation removed. This acreage figure is 4.2% of the bear habitat that would be in timber management.
Lop and Scatter	Decrease forage on 2,132 acres.	Adverse 1-5 years	Low	Slash would cover herbaceous vegetation until decayed. It also hinders movement.

BLACK BEAR
ALTERNATIVE A (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
Burn in Place	Increase forage by 137 acres.	Beneficial 2-10 years	Low	Burning increases forage production. Burns in clearcuts where huckleberries are the predominant shrub are especially beneficial and relatively long term.
5. Site Preparation:				
Mechanical Scarification	Decrease forage on 80 acres.	Adverse 10-30 years	Low	Same as slash disposal, pile and burn. This is 0.4% of the bear habitat that would be in timber management.
Burn	Increase forage on 303 acres.	Adverse 2-10 years	Low	Same as slash disposal, burn in place.
6. Planting, Thinning	None measurable.	Neutral	None	
7. Fertilization	Increase forage vigor on 573 acres	Beneficial 1-3 years	Low	See comments for elk.

BLACK BEAR
ALTERNATIVE B

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	682 acre decrease in habitat.	Adverse. 10-20 years on 402 acres. 20+ years on 280 acres.	Low	See comments for elk. This acreage is 0.8% of the bear habitat that is in the timber management lands.
2. Use of Roads	Initial disturbance, decreased use of adjacent areas.	Adverse. Duration of road construction and timber sale.	Low	Bear are sensitive to and avoid disturbance.
	Continued disturbance.	Adverse Duration of open road	Low	Bear avoid disturbance. Management policy protects important areas.
3. Cutting Practices	Minor	Neutral	Low	Cutting practice as discrete action has little impact. See slash disposal and site preparation.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

BLACK BEAR
ALTERNATIVE B (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
4. Slash Disposal:				
Pile and Burn	Decrease forage on 4,286 acres.	Adverse 10-30 years	Low	Scarification of soil by cat piling decreases important forage species, especially in moist areas, huckleberry patches, and meadow areas. Duration is determined by type of forage area scarified. Intensity of impact is determined by the percentage of ground vegetation removed. This acreage figure is 4.8% of the bear habitat that would be in timber management.
Lop and Scatter	Decrease forage on 10,940 acres.	Adverse 1-5 years	Low	Slash would cover herbaceous vegetation until decayed. It also hinders movement.
Burn in Place	Increase forage by 137 acres.	Beneficial 2-10 years	Low	Burning increases forage production. Burns in clearcuts where huckleberries are the predominant shrub are especially beneficial and relatively long term.
5. Site Preparation:				
Mechanical Scarification	Decrease forage on 412 acres.	Adverse 10-30 years	Low	Same as slash disposal, pile and burn. This is 0.5% of the bear habitat that would be in timber management.
Burn	Increase forage on 1,552 acres.	Adverse 2-10 years	Low	Same as slash disposal, burn in place.
6. Planting, Thinning	None measurable.	Neutral	None	
7. Fertilization	Increase forage vigor on 2,936 acres.	Beneficial 1-3 years	Low	See comments for elk.

BLACK BEAR
ALTERNATIVE C

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	630 acre decrease in habitat.	Adverse. 10-20 years on 150 acres. 20+ years on 480 acres.	Low	See comments for elk. This acreage is 0.7% of the bear habitat that is in the timber management lands.
2. Use of Roads	Initial disturbance, decreased use of adjacent areas.	Adverse. Duration of road construction and timber sale.	Low	Bear are sensitive to and avoid disturbance.
	Continued disturbance.	Adverse Duration of open road	Low	Bear avoid disturbance. Management policy protects important areas.
3. Cutting Practices	Minor	Neutral	Low	Cutting practice as discrete action has little impact. See slash disposal and site preparation.
4. Slash Disposal:				
Pile and Burn	Decrease forage on 2650 acres.	Adverse 10-30 years	Low	Scarification of soil by cat piling decreases important forage species, especially in moist areas, huckleberry patches, and meadow areas. Duration is determined by type of forage area scarified. Intensity of impact is determined by the percentage of ground vegetation removed. This acreage figure is 3.1% of the bear habitat that would be in timber management.
Lop and Scatter	Decrease forage on 6,460 acres.	Adverse 1-5 years	Low	Slash would cover herbaceous vegetation until decayed. It also hinders movement.
Burn in Place	Increase forage by 1,800 acres.	Beneficial 2-10 years	Low	Burning increases forage production. Burns in clearcuts where huckleberries are the predominant shrub are especially beneficial and relatively long term.
5. Site Preparation:				
Mechanical Scarification	Decrease forage on 10 acres.	Adverse 10-30 years	Low	Same as slash disposal, pile and burn. This is 0.5% of the bear habitat that would be in timber management.
Burn	Increase forage on 40 acres.	Adverse 2-10 years	Low	Same as slash disposal, burn in place.
6. Planting, Thinning	None measurable.	Neutral	None	

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

BLACK BEAR
ALTERNATIVE D

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	636 acre decrease in habitat.	Adverse. 10-20 years on 374 acres. 20+ years on 262 acres.	Low	See comments for elk. This acreage is 0.8% of the bear habitat that is in the timber management lands.
2. Use of Roads	Initial disturbance, decreased use of adjacent areas.	Adverse. Duration of road construction and timber sale.	Low	Bear are sensitive to and avoid disturbance.
	Continued disturbance.	Adverse Duration of open road	Low	Bear avoid disturbance. Management policy protects important areas.
3. Cutting Practices	Minor	Neutral	Low	Cutting practice as discrete action has little impact. See slash disposal and site preparation.
4. Slash Disposal:				
Pile and Burn	Decrease forage on 3,997 acres.	Adverse 10-30 years	Low	Scarification of soil by cat piling decreases important forage species, especially in moist areas, huckleberry patches, and meadow areas. Duration is determined by type of forage area scarified. Intensity of impact is determined by the percentage of ground vegetation removed. This acreage figure is 5.0% of the bear habitat that would be in timber management.
Lop and Scatter	Decrease forage on 10,198 acres.	Adverse 1-5 years	Low	Slash would cover herbaceous vegetation until decayed. It also hinders movement.
Burn in Place	Increase forage by 652 acres.	Beneficial 2-10 years	Low	Burning increases forage production. Burns in clearcuts where huckleberries are the predominant shrub are especially beneficial and relatively long term.
5. Site Preparation:				
Mechanical Scarification	Decrease forage on 384 acres.	Adverse 10-30 years	Low	Same as slash disposal, pile and burn. This is 0.5% of the bear habitat that would be in timber management.
Burn	Increase forage on 1,447 acres.	Adverse 2-10 years	Low	Same as slash disposal, burn in place.

BLACK BEAR
ALTERNATIVE D (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
6. Planting, Thinning	None measurable.	Neutral	None	
7. Fertilization	Increase forage vigor on 2,737 acres.	Beneficial 1-3 years	Low	See comments for elk.

BLACK BEAR
ALTERNATIVE E

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	431 acre decrease in habitat.	Adverse. 10-20 years on 208 acres. 20+ years on 223 acres.	Low	See comments for elk. This acreage is 0.6% of the bear habitat that is in the timber management lands.
2. Use of Roads	Initial disturbance, decreased use of adjacent areas.	Adverse. Duration of road construction and timber sale.	Low	Bear are sensitive to and avoid disturbance.
	Continued disturbance.	Adverse Duration of open road	Low	Bear avoid disturbance. Management policy protects important areas.
3. Cutting Practices	Minor	Neutral	Low	Cutting practice as discrete action has little impact. See slash disposal and site preparation.
4. Slash Disposal:				
Pile and Burn	Decrease forage on 2,384 acres.	Adverse 10-30 years	Low	Scarification of soil by cat piling decreases important forage species, especially in moist areas, huckleberry patches, and meadow areas. Duration is determined by type of forage area scarified. Intensity of impact is determined by the percentage of ground vegetation removed. This acreage figure is 3.4% of the bear habitat that would be in timber management.
Lop and Scatter	Decrease forage on 7,374 acres.	Adverse 1-5 years	Low	Slash would cover herbaceous vegetation until decayed. It also hinders movement.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

BLACK BEAR
ALTERNATIVE E (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
Burn In Place	Increase forage by 450 acres.	Beneficial 2-10 years	Low	Burning increases forage production. Burns in clearcuts where huckleberries are the predominant shrub are especially beneficial and relatively long term.
5. Site Preparation:				
Mechanical Scarification	Decrease forage on 283 acres.	Adverse 10-30 years	Low	Same as slash disposal, pile and burn. This is 0.4% of the bear habitat that would be in timber management.
Burn	Increase forage on 879 acres.	Adverse 2-10 years	Low	Same as slash disposal, burn in place.
6. Planting, Thinning	None measurable.	Neutral	None	
7. Fertilization	Increase forage vigor on 2,045 acres	Beneficial 1-3 years	Low	See comments for elk.

UPLAND GAME
PROPOSED ACTION

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads and Road Use	Change forage composition, decrease cover on 578 acres.	Beneficial 5-10 years	Low	Seeding with preferred forage grasses and forbs such as clover replaces forage lost by construction. Until revegetated, lack of cover increases vulnerability to predators.
2. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 593 acres.	Beneficial 5-10 years	Low	Increase of forbs and brush species on clearcuts. Upland game cover reestablished in 3-5 years.
Partial Cut and Commercial Thin	None measurable.	Neutral	Low	No impact anticipated.
3. Slash Disposal:				
Pile and Burn	Decrease forage 3,633 acres.	Adverse 5-10 years	Low	Scarification by heavy equipment removes forage species.
Log and Scatter	Increase cover 9,271 acres.	Neutral 1-3 years	Low	Accumulation of downed material is used as hiding cover.

UPLAND GAME
PROPOSED ACTION (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
Burn In Place	Increased forage in conjunction with clearcut on 593 acres.	Beneficial 5-10 years	Low	Burning in place on clearcuts favors forbs and grasses.
4. Site Preparation:				
Mechanical Scarification	Decrease forage on 349 acres.	Adverse 5-10 years	Low	Scarification removes natural composition and preferred forage species such as rose.
Burn	Increase forage on 1,315 acres.	Beneficial 5-10 years	Low	Burning increases forbs, grasses, induces vigorous sprouting of brush species.
5. Planting	None	Neutral	None	
6. Precommercial Thin and Sanitation Thin	None	Neutral	None	
7. Fertilization	Increase forage vigor on 2,488 acres.	Beneficial 1-3 years	Low	Vigor and Quality of forage would increase.

UPLAND GAME
ALTERNATIVE A

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads and Road Use	Change forage composition, decrease cover on 133 acres.	Beneficial 5-10 years	Low	
2. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 137 acres.	Beneficial 5-10 years	Low	
Partial Cut and Commercial Thin	None measurable.	Neutral	None	

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

UPLAND GAME
ALTERNATIVE A (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
3. Slash Disposal:				
Pile and Burn	Decrease forage on 836 acres.	Adverse 5-10 years	Low	
Lop and Scatter	Increase cover 2,132 on acres.	Neutral	Low	
Burn In Place	Increased forage on 137 acres.	Beneficial 5-10 years	Low	
4. Site Preparation:				
Mechanical Scarification	Decrease forage on 80 acres.	Adverse 5-10 years	Low	
Burn	Increase forage on 303 acres.	Beneficial 5-10 years	Low	
5. Planting	None	Neutral	None	
6. Thinning	None	Neutral	None	
7. Fertilization	Increase forage vigor on 573 acres.	Beneficial	Low	

UPLAND GAME
ALTERNATIVE B

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads and Road Use	Change forage composition, decrease cover on 682 acres.	Beneficial 5-10 years	Low	
2. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 700 acres.	Beneficial 5-10 years	Low	
Partial Cut and Commercial Thin	None measurable.	Neutral	None	

UPLAND GAME
ALTERNATIVE B (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
3. Slash Disposal:				
Pile and Burn	Decrease forage on 4,286 acres.	Adverse 5-10 years	Low	
Lop and Scatter	Increase cover on 10,940 acres.	Neutral	Low	
Burn In Place	Increased forage on 700 acres.	Beneficial 5-10 years	Low	
4. Site Preparation:				
Mechanical Scarification	Decrease forage on 412 acres.	Adverse 5-10 years	Low	
Burn	Increase forage on 1,552 acres.	Beneficial 5-10 years	Low	
5. Planting	None	Neutral	None	
6. Thinning	None	Neutral	None	
7. Fertilization	Increase forage vigor on 2,936 acres.	Beneficial	Low	Avoidance of riparian areas would protect important grouse habitat.

UPLAND GAME
ALTERNATIVE C

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads and Road Use	Change forage composition, decrease cover on 630 acres.	Beneficial 5-10 years	Low	
2. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 2,086 acres.	Beneficial 5-10 years	Low	
Partial Cut and Commercial Thin	None measurable.	Neutral	None	

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

UPLAND GAME
ALTERNATIVE C (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
3. Slash Disposal:				
Pile and Burn	Decrease forage on 2,650 acres.	Adverse 5-10 years	Low	
Lop and Scatter	Increase cover 6,460 on acres.	Neutral	Low	
Burn In Place	Increased forage on 1,800 acres.	Beneficial 5-10 years	Low	
4. Site Preparation:				
Mechanical Scarification	Decrease forage on 10 acres.	Adverse 5-10 years	Low	
Burn	Increase forage on 40 acres.	Beneficial 5-10 years	Low	
5. Planting	None	Neutral	None	
6. Thinning	None	Neutral	None	
7. Fertilization	No fertilization proposed.			

UPLAND GAME
ALTERNATIVE D

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads and Road Use	Change forage composition, decrease cover on 636 acres.	Beneficial 5-10 years	Low	
2. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 652 acres.	Beneficial 5-10 years	Low	
Partial Cut and Commercial Thin	None measurable.	Neutral	None	

UPLAND GAME
ALTERNATIVE D (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
3. Slash Disposal:				
Pile and Burn	Decrease forage on 3,997 acres.	Adverse 5-10 years	Low	
Lop and Scatter	Increase cover on 10,198 acres.	Neutral	Low	
Burn In Place	Increased forage on 652 acres.	Beneficial 5-10 years	Low	
4. Site Preparation:				
Mechanical Scarification	Decrease forage on 384 acres.	Adverse 5-10 years	Low	
Burn	Increase forage on 1,447 acres.	Beneficial 5-10 years	Low	
5. Planting	None	Neutral	None	
6. Thinning	None	Neutral	None	
7. Fertilization	Increase forage vigor on 2,737 acres.	Beneficial	Low	

UPLAND GAME
ALTERNATIVE E

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads and Road Use	Change forage composition, decrease cover on 431 acres.	Beneficial 5-10 years	Low	
2. Cutting Practices:				
Clearcut	Increase forage, decrease cover on 450 acres.	Beneficial 5-10 years	Low	
Partial Cut and Commercial Thin	None measurable.	Neutral	None	

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

UPLAND GAME
ALTERNATIVE E (Cont.)

Action	Effect on Habitat	Nature and Duration of Impact	Significance	Comments
3. Slash Disposal:				
Pile and Burn	Decrease forage on 2,384 acres.	Adverse 5-10 years	Low	
Lop and Scatter	Increase cover 7,374 on acres.	Neutral	Low	
Burn In Place	Increased forage on 450 acres.	Beneficial 5-10 years	Low	
4. Site Preparation:				
Mechanical Scarification	Decrease forage on 283 acres.	Adverse 5-10 years	Low	
Burn	Increase forage on 879 acres.	Beneficial 5-10 years	Low	
5. Planting	None	Neutral	None	
6. Thinning	None	Neutral	None	
7. Fertilization	Increase forage vigor on 2,045 acres.	Beneficial	Low	

ANIMALS DEPENDENT ON SNAGS
PROPOSED ACTION

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads Surface, Cut and Fill	Loss of 1,927 acres of habitat.	Adverse 150+ years	Low	Snags and potential snags are removed by road construction for at least 50 feet either side of road, 12 acres per mile. The acreage figure is 2.4% of the snag habitat that would be in timber management.
2. Use of Roads	Loss of 793 acres of habitat.	150+ years	Low	Open roads increase firewood harvest opportunity. Estimated 12 acres/mile removed in addition to that removed by construction. This is 1.0% of snag habitat that would be managed for timber.

ANIMALS DEPENDENT ON SNAGS
PROPOSED ACTION (Cont.)

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
3. Timber Harvest	None	Neutral	None	An average of two snags/acre (14" DBH or greater) would be maintained. Where snag densities are below desired levels, diseased and/or unmerchantable trees would be girdled to provide snags.
4. Other Actions	None	Neutral	None	

ANIMALS DEPENDENT ON SNAGS
ALTERNATIVE A

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	Loss of 444 acres of habitat.	Adverse 150+ years.	Low	See Proposed Action comments. This acreage is 2.3% of the snag habitat that would be in timber management.
2. Use of Roads	Loss of 182 acres of habitat.	Adverse 150+ years.	Low	See Proposed Action comments. This is 0.9% of the snag habitat that would be managed for timber.
3. Timber Harvest	None	Neutral	None	See the Proposed Action comments.

ANIMALS DEPENDENT ON SNAGS
ALTERNATIVE B

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	Loss of 2,274 acres of habitat.	Adverse 150+ years	Low	See Proposed Action comments. This acreage is 2.5% of the snag habitat that would be in timber management.
2. Use of Roads	Loss of 935 acres of habitat.	Adverse 150+ years	Low	See Proposed Action comments. This is 1.0% of the snag habitat that would be managed for timber.
3. Timber Harvest	None	Neutral	None	See the Proposed Action comments.

APPENDIX 4-2, TABLE A (Cont.)

IMPACTS TO WILDLIFE HABITAT

ANIMALS DEPENDENT ON SNAGS
ALTERNATIVE C

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	Loss of 2,099 acres of habitat.	Adverse 150+ years	Low	See Proposed Action comments. This acreage is 2.4% of the snag habitat that would be in timber management.
2. Use of Roads	Loss of 1,603 acres of habitat.	Adverse 150+ years	Low	See Proposed Action comments. This is 1.9% of the snag habitat that would be managed for timber.
3. Timber Harvest	None	Neutral	None	See the Proposed Action comments.

ANIMALS DEPENDENT ON SNAGS
ALTERNATIVE D

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	Loss of 2,120 acres of habitat.	Adverse 150+ years	Low	See Proposed Action comments. This acreage is 2.6% of the snag habitat that would be in timber management.
2. Use of Roads	Loss of 872 acres of habitat.	Adverse 150+ years	Low	See Proposed Action comments. This is 1.1% of the snag habitat that would be managed for timber.
3. Timber Harvest	None	Neutral	None	See the Proposed Action comments.

ANIMALS DEPENDENT ON SNAGS
ALTERNATIVE E

Action	Effect On Habitat	Nature and Duration of Impact	Significance	Comments
1. New Roads	Loss of 1,438 acres of habitat.	Adverse 150+ years	Low	See Proposed Action comments. This acreage is 2.1% of the snag habitat that would be in timber management.
2. Use of Roads	Loss of 744 acres of habitat.	Adverse 150+ years	Low	See Proposed Action comments. This is 1.1% of the snag habitat that would be managed for timber.
3. Timber Harvest	None	Neutral	None	See the Proposed Action comments.

GLOSSARY

GLOSSARY

Acre Foot: Volume of water that would cover one acre to a depth of one foot, equal to 43,560 cubic feet or approximately 326,000 gallons.

Activity Occasion: A unit of recreation use consisting of one individual participating in one recreation activity during any reasonable portion of or all of one day.

Activity Opportunity: A real choice to participate in a desirable recreational activity, such as picnicking, sailing, canoeing, or hiking.

Aesthetics: Dealing with the nature of the beautiful and with judgements concerning beauty.

Air Quality Standard: An established concentration, exposure time, or frequency of occurrence of a contaminant or multiple contaminants in the ambient air which shall not be exceeded.

Allotment: An area of land where one or more individuals graze their livestock. It generally consists of public land but may include parcels of private or state owned lands. An allotment may consist of several pastures.

Allowable Cut: The amount of forest products that may be harvested annually or periodically from a specified area over a stated period in accordance with the objectives of management.

Alluvium: Clay, silt, sand, and gravel or other rock material transported by flowing water, and deposited as sorted or semi-sorted sediments.

Ambient Air: Any unconfined portion of the atmosphere; the outside air.

Anadromous Fish: Fish which migrate from the sea to breed in fresh water. Their offspring return to the sea.

Animal Unit Month (AUM): The amount of forage required to sustain one cow (1,000 lbs.) with one calf under 6 months of age or their equivalent for one month. For this EIS an AUM represents 800 pounds (air dried) of palatable forage.

Annual Cut: Amount of timber, usually measured in board feet, harvested annually.

Aquatic Vegetation: Plants which grow in water.

Aquifer: A geologic unit that contains water and that can deliver it to wells, springs, or seeps.

Archaeological Resources: The physical evidence of past human occupation which can be used to reconstruct the culture of past peoples. The archaeological record is usually expressed in the form of districts, sites, structures, and objects.

Artifact: Any object made, modified, or used by man, usually movable.

Aspect: The direction a slope faces.

Biomass: The total mass or amount of living organisms in a particular area expressed quantitatively.

Board Foot: A unit of solid wood, 1 foot square and 1 inch tick.

Buffer Strip: A protected area that separates the timber cutting unit from the object or thing to be preserved.

Bureau Planning System: A process used in the BLM to establish land use allocations, constraints, and objectives for various categories of public land use.

Cable Yarding: Using a steel cable to transport logs from where they are cut to a stationary machine on the landing. Yarding can be done in uphill or downhill directions with the logs being dragged or lifted partially or completely above the ground.

Canopy: The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Canopy Cover: The aerial foliage in a vegetation layer shading vegetation in lower layers.

Cavity Nesters: Birds and animals that live in holes or openings in trees, snags, or cliffs.

Climax: When plants of the existing vegetative community are the only ones which can perpetuate themselves.

Clearcutting: A method of timber harvesting in which all trees, merchantable or unmerchantable, are cut from an area at one time.

Commercial Thinning: Removal of merchantable surplus trees.

Commodity Emphasis: Would emphasize the management, production, and use of resources such as minerals, timber, and domestic livestock AUMs.

Community Type: Groups of plants (usually grasses/forbs and shrubs) which grow together in recognizable associations.

Contrast Rating: A method for determining the extent of visual impact for an existing or proposed activity that will modify any landscape feature.

Control of Competing Vegetation: This practice is done to increase light, water, and nutrients available to desirable coniferous trees by damaging or killing other vegetation. This practice can be accomplished using chemical herbicides or hand slashing (cutting).

Critical Habitat: That habitat considered by the Secretary of the Interior to be necessary to the normal needs or survival and recovery of listed Threatened or Endangered Species. It may also include habitat not currently occupied into which a listed species could expand.

Cull: Any item of production, e.g., trees, logs, lumber, picked out for rejection because it does not meet certain specifications.

Cultural Resources: Those fragile and nonrenewable remains of human activity, occupation, or endeavor, reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features, that were of importance in human events. These resources consist of 1) physical remains, 2) areas where significant human events occurred--even though evidence of the event no longer remains, and 3) the environment immediately surrounding the actual resource. Cultural resources, including both prehistoric and historic remains, represent a part of the continuum of events from the earliest evidences of man to the present day.

Custodial Timber Management Lands: Lands in this class would not be managed for timber productions and are not included in allowable cut computations. These lands are usually managed for other resource values, i.e., wildlife, range, recreation, etc. Timber would be removed when necessary to protect or enhance adjacent forest or other resource values.

Distance Zone: The area that can be seen as foreground, middleground, background, or seldom seen.

Ecosystem: An ecological unit consisting of both living and nonliving components which interact to produce a natural, stable system.

Edge Effect: An area where the types of food and cover are more diverse thus creating a more favorable wildlife habitat, i.e., meadow abutting forest or logged area adjacent to or surrounded by "natural" vegetation.

Endangered Species: Those species officially designated by the Fish and Wildlife Service through publication in the Federal Register as being in danger of extinction throughout a significant portion of their range. The Endangered Species Act of 1973 requires that critical habitat for endangered species be delineated and enjoins Federal agencies from taking actions within such designated critical habitat that would have a significant adverse impact on the endangered species.

Endemic: A species that is restricted to a relatively small geographic area or to an unusual or rare type of habitat.

Environmental Assessment (EA): A systematic environmental analysis of site-specific BLM activities. Used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental statement is required.

Equivalent Inch: Depth of runoff water if spread over the area it precipitated on.

Erosion (Soil): Removal of soil from its place of origin to a point of deposition other than a stream channel.

Even-Aged Stand: All trees are the "same" age or at least of the same age class.

Experience Opportunity: The opportunity for a recreationist to realize a preferred self-rewarding experience by participating in a chosen activity in a preferred setting.

Extensive Timber Management Lands: Lands in this class would be managed for sustained yield timber production; however, no thinnings or fertilization practices would be used. Planting would be used if natural regeneration fails. These lands are generally in the alpine zone (5,000 feet plus in elevation) and have slopes over 60 percent.

Falling/Felling: Cutting down trees.

Flow: The volume of water passing a given point in a specified period of time.

Forage Area: Includes any area within elk habitat which does not qualify as cover, excluding natural barren areas such as talus, rock outcrops, rivers, or lakes. It is recognized that elk also feed in areas which may provide cover, but the simplification is justified for management purposes.

Forest Land: Land that is now, or is capable of becoming, at least 16.7 percent stocked with forest trees and that has not been developed for nontimber use.

Forest Litter: A layer of freshly fallen or slightly decomposed organic matter found on the forest floor.

Forest Management Program: Includes timber activity plan and all forest resource related program activity plans.

Frost Heaving: The uplifting and loosening of soil caused by the expansion of water as it freezes.

Full Suspension Logging: Transporting logs from where they are cut to the landing with both ends lifted above the ground.

Ground Based Yarding: The process of dragging logs behind a moving machine or animal from where they are felled to the landing. Ground based yarding is normally done in a downhill direction.

Groundwater: Subsurface water in the zone of saturation.

Habitat: The environment in which an organism occurs.

Habitat Type: An area of land potentially capable of producing similar plant communities at climax.

Hiding Cover (Elk): Includes coniferous vegetation, and in specific instances, can include deciduous vegetation capable of hiding 90 percent of an elk from a human's view at a distance equal to or less than 200 feet (61 m).

Historical Resources: All evidences of human activity that date from historic, i.e., recorded history periods. Historic resources are cultural resources and may be considered archaeological resources when archaeological work is involved in their identification and interpretation.

Individual Tree Selection: A form of partial cutting that removes selected individual trees from the stand.

In-Place Burning: Intentional burning of slash where it lies.

Intensive Timber Management Lands: Lands in this class would be managed using practices such as thinnings, site preparation, planting, fertilization, etc., to maximize timber production on a sustained yield basis. Generally, these lands are TPCC rated Non-Problem or Restricted Productive which would respond to thinning, fertilization, and planting. Elevations are usually below 5,000 feet and slopes less than 60 percent.

Invertebrates: Animals without backbones.

Landing: Any place on or adjacent to the logging site where logs are assembled for further transport.

Lateral Yarding: Movement of a log toward or into a skyline corridor.

Lithic Materials: Implements or tools made from stone.

Live Skyline Systems or Slackline: A cable yarding system which consists of a series of cables (skyline, mainline, haulback, etc.), and a carriage that runs on the skyline. In this system, the skyline can easily be raised or lowered. The system is capable of transporting logs uphill or downhill, and lifting logs partially or completely off the ground during the transportation process.

Lop and Scatter: Cutting branches, tops, and small trees after felling so that the resultant slash will lie close to the ground; to cut limbs from felled trees.

Lower Gradient Stream: Streams in which the slope of the channel approaches zero.

Macroinvertebrates: Animals without backbones which are visible to the naked eye.

Management Framework Plan (MFP): Land use plan for public lands which provides a set of goals, objectives, and constraints for a specific planning area to guide the development of detailed plans for the management of each resource.

Mean Annual Increment: The total growth of the tree divided by the total age.

Microclimate: Localized variations in the general climate caused by environmental factors such as topography, vegetation, man, etc.

Mortality/Salvage Cutting: Removal of individual trees killed or injured by fire, insects, disease, etc., and the removal of those trees likely to die prior to final harvest cut so as to utilize merchantable material.

Multiple Use: Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.

National Register of Historic Places (National Register): Established by the Historic Preservation Act of 1966. A listing maintained by the National Park Service of architectural, historical, archaeological, and cultural sites of local, state, or national significance. Sites are nominated to the Register by the states and by Federal agencies. Copies of the National Register are available from the Superintendent of Documents, USGPO, Washington, D.C. 20402.

Non-attainment Area: A designated area that does not meet ambient air quality standards.

Non-Commodity Emphasis: Would emphasize the enhancement of air, water, and visual quality; dispersed recreation opportunities; wildlife habitat; and the protection of cultural resources.

Non-forest Land: Land that has been developed for non-timber uses or land that is incapable of being 16.7 percent stocked with forest trees.

Non-point Source Pollution: Pollution caused by the introduction of materials from diffuse sources (i.e., sediment, nutrients), or from a natural or manmade alteration in the stream system.

Non-problem Sites: Productive forest sites characterized by stable soils and bedrock. They can be logged by normal ground based and cable practices, and reforestation can be established within 5 years after final harvest using normal techniques.

Non-productive Forest Land: Land which is not capable of yielding at least 20 cubic feet of wood per acre per year from commercial species, or land which is capable of producing only non-commercial tree species.

Off-Road Vehicle (ORV): Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, i.e., marsh, swamp land, or other terrain.

Old-growth Dependent: An animal species so adapted that it can exist only in old-growth forests.

Overstory: The uppermost vegetative "layer" of a forest (usually trees).

Paleontology: The study of life in past geologic periods, based on fossil plants and animals; and the chronology of the earth's history.

Partial Cutting or Selective Cutting: Tree removal other than by clearcutting.

Partial Suspension Logging: Transporting logs from where they are cut to the landing with one end dragging on the ground.

Particulates: Finely divided solid or liquid particles in the air or in an emission; includes dust, smoke fumes, mist, spray, and fog.

Pesticides: Any chemical preparation used to control populations of injurious organisms, plants, or animals.

Pioneer Species: Hardy sun-loving plants that invade disturbed soil and persist there until they cannot reproduce in their own shade.

Plant Community: An association of plants of various species found growing together in different areas with similar site characteristics.

Precommercial Thinning: Removal of surplus trees in a stand prior to their reaching merchantable size.

Prehistoric Resources: All evidences of human activity that pre-date recorded history and can be used to reconstruct lifeways and culture history of past peoples. These include sites; artifacts; environmental data; and all other relevant information and the contexts in which they occur.

Prescribed Burning: Skillful application of fire to natural fuels under conditions of weather; fuel moisture; soil moisture; and other conditions that will produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives of silviculture, wildlife management, grazing, and hazard reduction.

Primitive Recreation Opportunity Class: Opportunity for isolation from the sights and sounds of man. Opportunity to feel a part of the natural environment; to have a high degree of challenge and risk; and to use outdoor skills.

Productive Forest Land: Forest land that is now producing or is capable of producing at least 20 cubic feet per acre per yer of commercial coniferous tree species.

Productive Forest Land Excluded From the Base: Productive forest lands where the use of special logging practices or reforestation techniques would still result in degradation of the site or failure of the area to reforest within 5 yers after harvest. These lands are not included in the allowable cut base.

Public Land: Historically, the public domain administered by the Bureau of Land Management for the purpose of providing forage, wood products, and minerals for public users. The uses and resources of these public lands have been expanded in recent years to provide open space, recreation resources, protection of cultural resources, and other commodities.

Put-To-Bed: Process of abandoning a road. Usually involves scarifying the road surface, water barring, seeding, and possibly blocking the road.

Recreation Opportunities: The opportunity to participate in an intrinsically, or self, rewarding experience that finds its source in voluntary engagements (mental and/or physical) during non-obligated time.

Reforestation: Reestablishment of a tree crop on forest land.

Regeneration: The renewal of a tree crop whether by natural or artificial means; also, the young crop itself.

Regeneration Cut: One of the phases of shelterwood cutting designed to open the canopy of a stand sufficiently to allow the establishment of regeneration, i.e., the first stage of a two-stage shelterwood cutting.

Restricted Use Sites: Productive forest sites that need special logging practices or reforestation techniques to preserve soil productivity or reforest the site within 5 years after final harvest.

Riparian: As used here, riparian refers to the areas adjacent to streams and other bodies of water; wet meadows; springs; wells; and other sources.

Riparian Vegetation: Plants growing in close proximity to a watercourse, lake, or wet areas, and often the plants depend on their roots reaching the water table.

Roaded-Natural Recreation Opportunity Class: About equal opportunities for affiliation with user groups and opportunities for isolation from sights and sounds of man. Opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities are not very important. Practice and testing of outdoor skills may be important. Opportunities for both motorized and non-motorized forms of recreation are possible.

Rotation: The period of years required to establish and grow timber crops to a specified maturity.

Sanitation Thinning: Removal of surplus trees from a stand. The trees may be of merchantable or unmerchantable size. A commercial thinning would not necessarily follow:

Scarification: Disturbance of the upper soil layer by mechanical means in preparing a site for seeding or planting.

Scenic Areas: Areas of outstanding scenic quality which are protected from adverse visual impact by administratively withdrawing them from timber production.

Scenic Quality: The degree of harmony, contrast, and variety within the landscape.

Scouring: Erosion of the stream channel caused increased flow velocities.

Scribner Log Rule: A log rule constructed from diagrams which shows the number of l-inch boards which can be drawn in a circle representing the small end of a log; assumes a l/4-inch saw kerf, makes a liberal allowance for slabs, and disregards taper.

Sediment Yield: Eroded soil reaching a water system.

Security Cover (Elk): Includes habitat which, because of its size, topography, and vegetation, is capable of holding elk during periods of stress. The size of area varies with the combination of space and hiding cover necessary for elk to be psychologically secure in relation to the degree of human access.

Seed Tree: A form of two-stage partial cutting that removes more than 80 percent of the existing stand. The remaining trees provide seed for the new forest and are removed about 10 years later.

Semi-Primitive Motorized Recreation Opportunity Class: Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills. Explicit opportunity to use motorized equipment while in the area.

Semi-Primitive Non-Motorized Recreation Opportunity Class: Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills.

Semi-Urban Recreation Opportunity Class: Opportunities to experience affiliation with individuals and groups at sites with convenience facilities are prevalent. These factors are generally more important than the physical environment. Opportunities for wildland challenges, risk taking, and testing of outdoor skills are unimportant except for those activities like downhill skiing when challenge and risk taking are prevalent.

Sensitive Animals: Animals classified by the BLM and Idaho Fish and Game Department are those:
--not yet officially listed but which are undergoing a status review or are proposed for listing according to Federal Register notices published by the Secretary of the Interior or the Secrtary of Commerce, or according to comparable State documents published by State officials;
--whose populations are consistently small and widely dispersed, or whose ranges are restricted to a few localities, such that any appreciable reduction in numbers, habitat availability, or habitat condition might lead toward extinction; and
--whose numbers are declining so rapidly that official listing may become necessary as a conservation measure. Declines may be the cause of one or more of several factors including destruction, modification, or curtailment of the species' habitat or range; overutilization for commercial, sporting, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; and/or other natural or manmade factors adversely affecting the species' continued existence.

Seral Stages: Communities of plants that occupy an area as succession progresses toward climax.

Series: A group of habitat types with the same climax tree species.

Setting Opportunity: The opportunity to participate in the desired activity in a preferred physical, social, and management setting. For example, a downhill-lift ski enthusiast might prefer a setting characterized by expert runs with little air pollution (physical), few people on the slope (social), and inexpensive lift tickets (management).

Sheet Flows: The flow of water over the ground surface in a more or less continuous sheet from where it was precipitated to where it reaches a channel.

Shelterwood Cutting: A series of two partial cuttings designed to establish a new crop of trees under the protection of the old.

Sidecast: Type of construction method whereby material cut from the slope face to create a road subgrade is allowed to spill over the outside edge of the cut.

Sight Distance (Elk): The distance at which an elk is hidden from view within any cover type. This varies according to the size and spacing of coniferous trees. Deciduous vegetation can be considered in sight distance measurements only when in dormant condition (without leaves).

Silviculture: The art of producing and tending a forest; application of the knowledge of the life history and general characteristic of forest trees and stands for controlling the establishment, composition, and growth of a forest.

Site Preparation: This practice is done to reduce competition between newly established trees and other vegetation, and to expose mineral soil to encourage the establishment of natural regeneration.

Skidding: A loose term for hauling logs by sliding from stump to roadside.

Skid Trail or Road: Any way, more or less prepared, over which logs are dragged.

Skyline or Cable Corridor: A cleared area about 15 feet wide in which logs travel to the landing. These corridors are only found in cable logging units.

Skyline Carriage: A wheeled device used in skyline cable logging which rides back and forth on the skyline during yarding. If it is used in a partial cut, the carriage is equipped with a lock which holds it in place on the skyline during lateral yarding.

Slash: The residue left on the ground after felling timber.

Smolt: A young salmon which is migrating from fresh water to the ocean.

Snag: A standing dead tree from which the leaves and most of the branches have fallen.

Snag Dependent Animals: Animals that depend on dead trees for all or part of their life cycles.

State Historic Preservation Officer (SHPO): The official within each State, authorized by the State at the request of the Secretary of the Interior, to act as a liaison for purposes of implementing the National Historic Preservation Act of 1966.

State Lieu: The State of Idaho Admissions Act of July 3, 1980, granted Sections 16 and 36 of each surveyed township to the State Government. These lands were to be managed for endownment funds to beneficiary institutions. Since some of the endowment lands were already in private ownership or dedicated to some other land use at the time of the Admissions Act, the State is now allowed to select equal lands from the remaining unappropriated public lands. The lands administered by the Bureau of Land Management (BLM) are those lands from which the State may select for endownment purposes, the lieu selection.

Strata: A horizontal layer of vegetation resulting from the relative canopy heights of trees and shrubs and vertical space inhabited by grasses and forbs.

Succession: The orderly process of community change. Process by which one plant community will succeed another over time given the same climatic conditions.

Sustained Yield: The yield that a forest can produce continuously at a given intensity of management.

Thermal Cover: Defined as a stand of coniferous trees which is 40 feet (12 m) or more in height, has at least 70 percent average crown cover, and which moderates extremes of ambient temperature. (Pederson, personal communication as cited in Black et al. 1976; and Keay, J. A., 1977).

Threatened Species: Those species which are likely to become endangered in the foreseeable future throughout all or a significant portion of their range. Critical habitat can also be designated for threatened species (see endangered species).

Threshold: A point (value) on a continuim that when exceeded cause a significant impact.

Timber Activity Plan: A plan which deals specifically with the implementation of the approved allowable cut.

Timber Production Base: Acres included in the calculation of the allowable cut.

Timber Production Capability Classification (TPCC): A classification system that identifies the commercial forest base which is capable of producing timber on a sustained yield basis.

Timber Stand: A group of trees occupying an area and sufficiently uniform in composition (species), age, size, and condition to be recognized for other groups of vegetation.

Understory Species: Shade-tolerant plant species which characteristically grow beneath the forest canopy.

Uneven-Aged Stand: A stand having at least three age classes intermingled intimately on the same area.

Unit Resource Analysis (URA): A BLM planning document which contains a comprehensive inventory and analysis of the physical resources and an analysis of their potential for development within a specified geographic area.

Urban Recreation Opportunity Class: Opportunity to experience affiliation with individuals and groups is prevalent as is the convenience of sites and opportunities. Experiencing natural environments, having challenges and risks afforded by the natural environment, and the use of outdoor skills are relatively unimportant.

Visual Contrast: The effect of a striking difference in the form, line, color, or texture of an area being viewed.

Visual Resource: The land, water, vegetation, animals, and other features that are visible on all public lands.

Visual Resource Management Class: The degree of alteration that is acceptable within the characteristic landscape. It is based upon the physical and sociological characteristics of any given homogenous area.

Visual Sensitivity: The degree of concern expressed by the user toward the scenic quality and existing or proposed visual change in a particular characteristic landscape.

Water Yield: Precipitation minus losses for evaporation and transpiration. Usually expressed in equivalent inches or acre feet.

Wild and Scenic River: Any free-flowing stream designated and authorized for inclusion in the National Wild and Scenic Rivers System as provided by the Wild and Scenic Rivers Act of October 1968 (P.L. 90-542).

Windthrow: The natural process of wind uprooting trees or the term given to the uprooted trees.

Xeric: A soil moisture regime resulting from a climate having moist cool winters and warm dry summers. Moisture is present in limited amounts but not at the optimum period for plant growth.

Yarding: The initial haul to a loading point, i.e., transporting timber from the stump to a landing.

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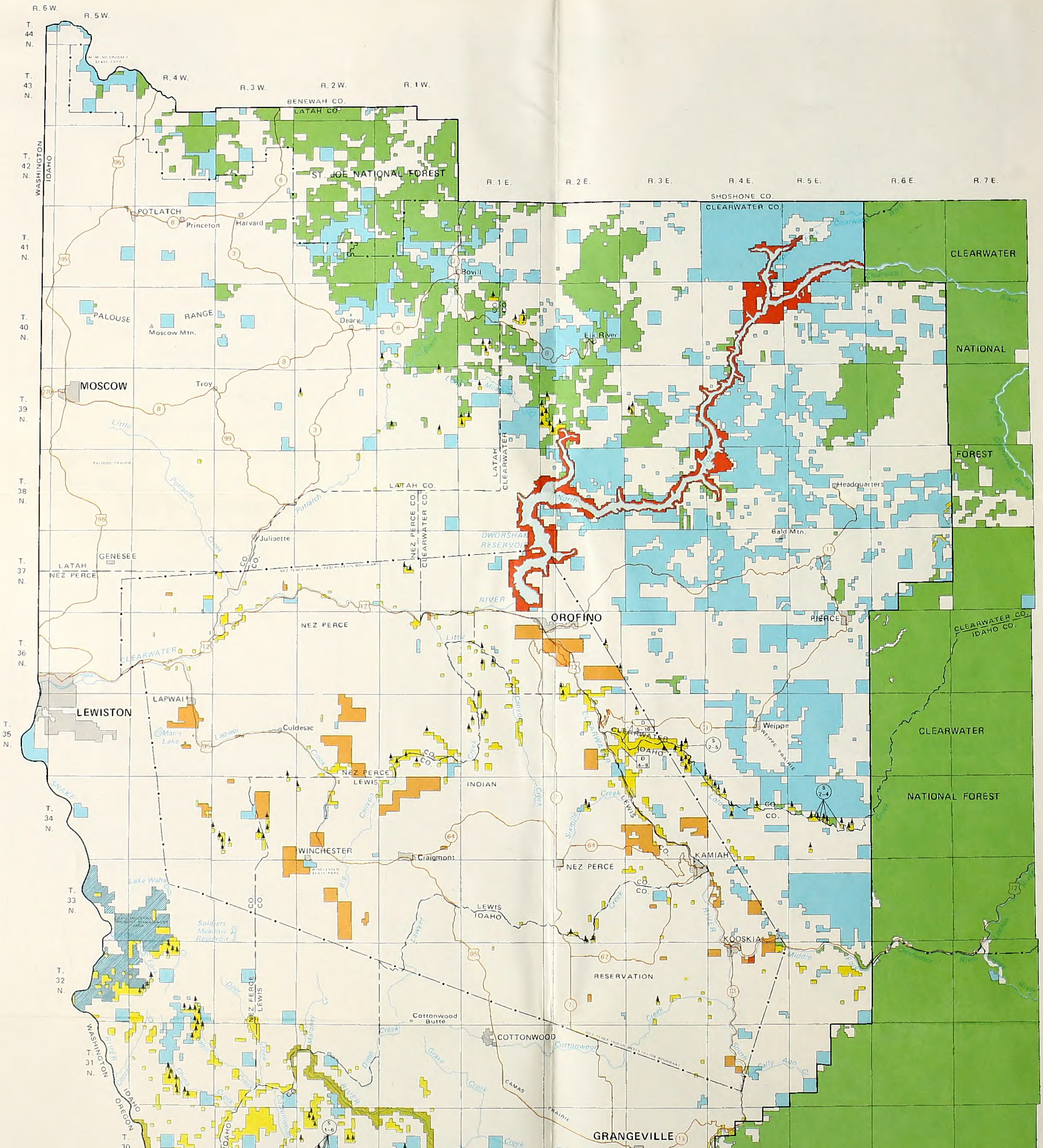
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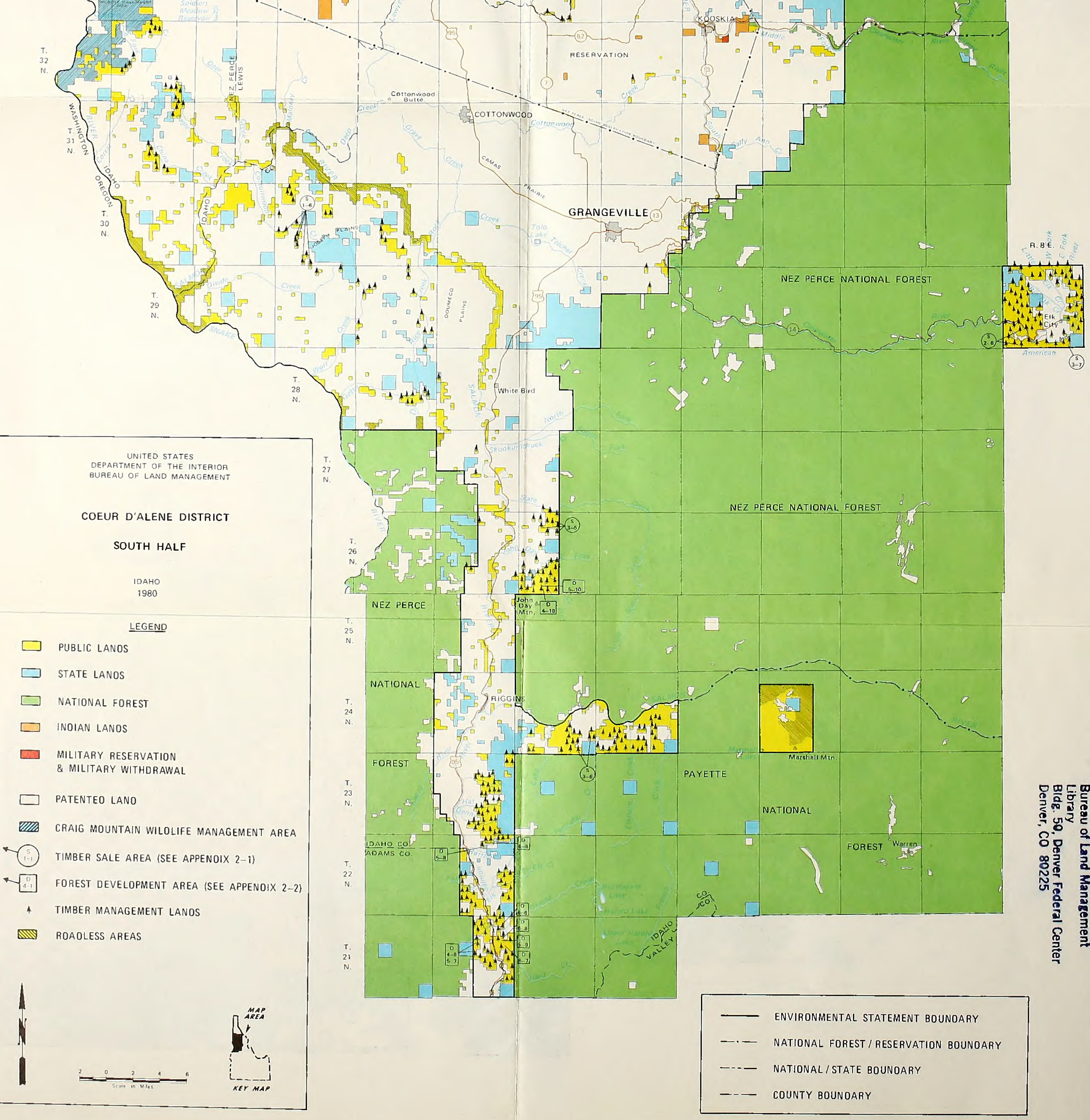

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▨ CRAIG MOUNTAIN WILDLIFE MANAGEMENT AREA

Ⓢ TIMBER SALE AREA (SEE APPENDIX 2-1)

▢ FOREST DEVELOPMENT AREA (SEE APPENDIX 2-2)

▲ TIMBER MANAGEMENT LANDS

▨ ROADLESS AREAS

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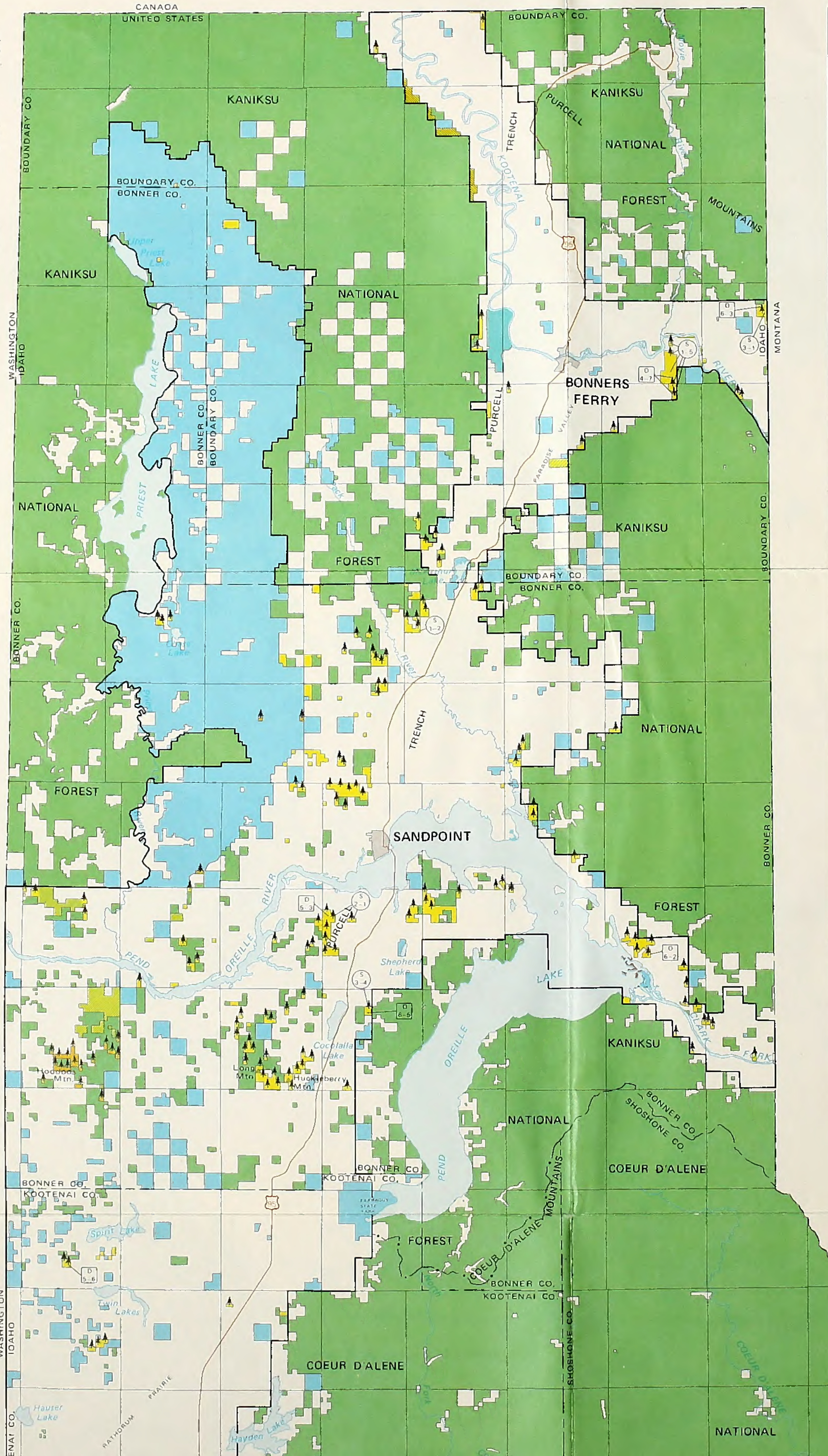

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S 1-1	TIMBER SALE AREA (SEE APPENDIX 2-1)
D 4-1	FOREST DEVELOPMENT AREA (SEE APPENDIX 2-2)
▲	TIMBER MANAGEMENT LANDS
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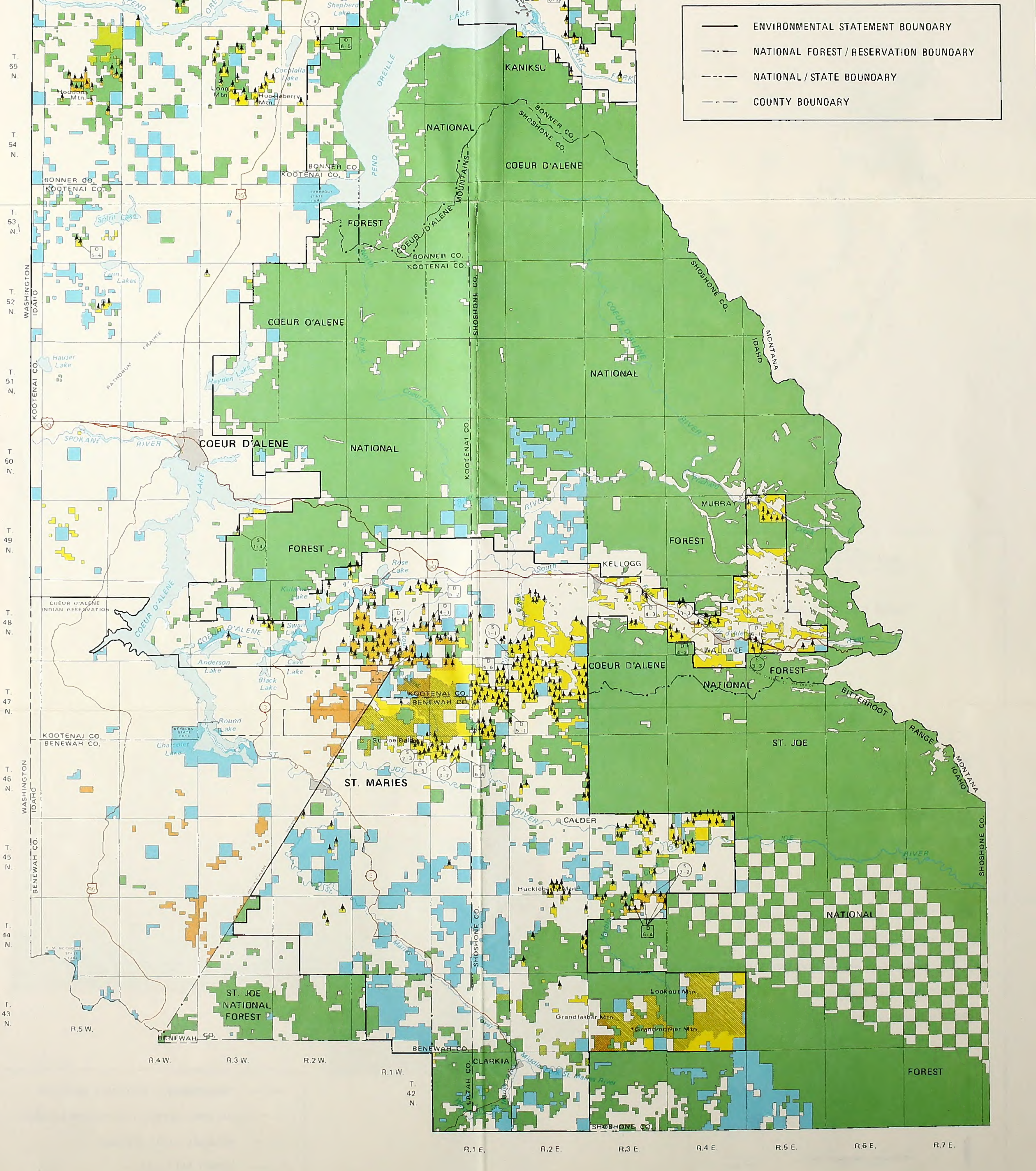
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